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SMITHSONIAN FUND:

SUGGESTIONS AS TO ITS APPLICATION: BY J. W. HARDY, OF VA.

With respect to this Fund, so generously bestowed on our country, by a foreigner, and which still remains in a state of sequestration, we have always held the opinion, so ably and irresistibly enforced in the following essay, that it should be so disposed of as to diffuse a knowledge of the science and illustrate the best practice of *Agriculture and Horticulture*; in the proportion that these branches of industry contribute to the sustenance, growth and well-being of the country. At all events, in the name of common decency and gratitude, let *something be done with it*—or let it be restored to the heirs of the Testator, who are fast acquiring a right to recover it, in any court of equity. The difficulty, as we have always foreseen, will be in the various conceits of Members of Congress, each one of the few who can be roused to an interest in the subject, imagining that his own is the only wise plan of investing and using the money. There are, too, even among those who ardently desire its benefits for the legitimate objects of the bequest, some who would yet make difficulty even about the *name* of the Establishment to be created; like the dog who, in crossing the stream, let go his meat for the sake of an empty shadow. So far from higgling about a matter so really unsubstantial, when compared with a judicious application of the Fund, we would not, for its sake, lose a day's interest of the money. But if difficulties so visionary must be entertained, surely there could be nothing very far wrong or graceless in giving it the name of Smithson. If he made no intimation of such a condition, it does not follow that he did not regard it as a somewhat material occurrence. At all events there would seem to be, on that account, not the less propriety, not to say obligation, to associate, with a magnificent public benefaction, the *name of the generous foreigner who bestowed it.* If other Institutions or interests would reject the name, and with it the boon, we will answer for it that *Agriculture* will not be so fastidious. Her votaries will gladly and gratefully inscribe his name on any temple dedicated by his munificence to her benefit and glory.

Francis Markoe, Jr. Esq.

Cor. Secretary of the National Institute:

Dear Sir: The representatives of the people are again assembled in Congress, and a bill has been introduced to dispose of the large Fund bequeathed to the United States by Mr. Smithson. I assume, as granted, that the faith and honor of the Nation, as to this Fund, will be preserved inviolate; and it would be gratifying to me if the credit of establishing an Institution, honorable to the Nation, and suitable to the liberal designs of Mr. Smithson, should belong to the present Congress. An occasion more fit than the present will hardly present itself for publishing, through you, some views respecting this interesting subject. With becoming deference I proceed at once to my object.

The expressive language of Smithson, as to the design he wished to accomplish with the Fund, is doubtless remembered: "The increase and diffusion of Knowledge among men." I agree with the late memorable Du Ponceau, that, in considering attentively the words of Mr. Smithson, we must be convinced that "his views were more extensive than the foundation of an establishment for the promotion of particular objects of Science, and that he contemplated an Institution that would embrace the whole

circle of human knowledge." In this circle, however, there are many departments—some of relatively little value, others of essential importance, vitally connected with the industrial pursuits and well-being of man. It is my purpose to bring forward, as I may be able, the claims of Agriculture to a prominent place in the Institution about to be established.

In attempting to show these claims, we must not be supposed to underrate the great interests of Commerce, Mining, Manufactures, and similar pursuits. These interests and those of Agriculture are closely related. They are mutually beneficial—they flourish and decline together. Especially, if Agriculture, the leading interest among us, shall be promoted, all other departments of human labor will feel the beneficial impulse.

The United States are now, and must continue for a long period, essentially an agricultural nation. This is proved by the last Census. The "Compendium of the Sixth Census," as prepared by the Department of State, shows that in 1840 there were engaged in Agriculture 3,719,951 persons, while at the same time there were in all other kinds of business only 1,079,548 persons. For *every* person, therefore, engaged in other kinds of business, we find more than *three* employed in Agriculture—the ratio between the foregoing numbers being 1 to 3.44+. When we consider this ratio, together with the sparseness of our population, and our large and increasing territory, we must be regarded as an agricultural people, and destined so to continue. The habits and the interests of the people incline them, as a body, to the country, where may be found the true freedom and independence of America. The inestimable value of our social and civil institutions is seen nowhere, we think, to as great advantage as in the farm-house, or the country mansion of the planter. So long as the spirit of those institutions exists among us, we shall continue an agricultural people.

To show the preëminent claims of Agriculture to our attention, we will refer to some statistics relating to particular sections of the country. We shall assume Massachusetts, Virginia, Mississippi, and Indiana, as fit representative States of different sections of the Union, and briefly notice this agricultural condition.

In 1840, Massachusetts contained 87,837 persons employed in Agriculture, 85,166 in Manufactures and Trades, 35,219 in Commerce and Navigation, and 4,675 in other pursuits. It would seem, therefore, that, judging from the number of persons employed, we should regard the interests of Agriculture preëminent even in the Old Bay State, where other interests are cherished and protected with much care. The following table shows the ratio of the number of persons employed in Agriculture to the number employed in all other pursuits, in Virginia, Mississippi and Indiana:

	Agriculture.	Other pursuits.	Ratio.
Virginia	318,771	69,903	4.56+
Mississippi	139,724	7,077	19.74+
Indiana	148,806	26,852	5.54+

The agricultural population is, therefore, more than *four and a half* times as large as the population depending on other kinds of labor in Virginia; more than *nineteen and a half* times in Mississippi; and in Indiana more than *five and a half* times as large. If, as political economists may contend, the profits of Agriculture and other forms of human labor are equal, the value of agricultural profits for 1 year is equal to the profits of all other pursuits for 4¼ years in Virginia, nearly 20 years in Mississippi, and 5½ years in Indiana. Are not the claims of Agriculture to the protection and favor of Government proportionately strong? If, as we have shown, *three-fourths* of the whole population of the country, and if *nineteen-twentieths* of some States are employed in Agriculture, it should seem but just that its invaluable interests receive proportionate care.

If we were to consider the counties of the different States, or even of a single State, equally decisive results would be obtained. We shall refer only to the county of Mecklenberg, from which we write. The number of persons employed in Agriculture in this county is 6,572; while those otherwise employed number only 789—giving the ratio of 1 to 8.3+. So that more than *eight-ninths* of the population of this large and respectable county subsist by cultivating the soil; and of the 789 who are said to be otherwise employed, I know but very few who do not receive the means of subsistence, more or less, from the same source. This is, no doubt, true also of nearly every county in the State, and perhaps in the Union.

Not wishing to be tedious, I will conclude this part of the subject with a brief reference to the annual products of some of our most valuable crops. A table of much interest respecting Agriculture may be found at page 375 of the "Compendium of the Sixth Census," already mentioned; which may also be found in "Tucker's Progress of the United States," and at page 274 of that most excellent publication, the "Monthly Journal of Agriculture," by Mr. Skinner, of New-York. From that table we take the following results:—The United States produce annually 84,823,272 bushels of Wheat, 123,071,341 bushels of Oats, 377,531,875 bushels of Indian Corn, 108,278,060 bushels of Potatoes, 219,163,319 pounds of Tobacco, 790,479,275 pounds of Cotton, and 155,110,809 pounds of Sugar. If we estimate these crops according to their present prices in the city of Richmond, Va. we shall find them to be worth from four

hundred and fifty to five hundred million dollars. Hence the annual productive value of the seven crops above mentioned is nearly equal to half the value of the entire agricultural and dairy produce of the British Empire, which has been recently estimated at eleven hundred million dollars. If we were to increase the amount given above by the annual produce of the live stock and all the remaining crops of the country, we should form a probable estimate of its agricultural wealth.

May we not, then, be safely considered, in the aggregate, a nation of planters? And is not the cultivation of the soil the basis of our national wealth? The dignity of the plow should be asserted, and every friend of American greatness and independence should strive to give efficiency and success to whatever will elevate and strengthen the agricultural interests of the nation.

We shall next consider how the interests of Agriculture may be subserved in the establishment of the proposed Smithsonian Institution. If what we have written above be attentively regarded, it will be duly conceded, we think, that an Agricultural Department of wide extent should be preëminent among its objects.

How should such a Department be organized? We propose to answer this question at some length.

We place among the *first* requisites of this Department a well-appointed Chemical Hall, or Laboratory.

Agriculture is a chemical Art. The atmosphere which surrounds the growing plant—the water that refreshes and gives it vigor—the soil into which its roots penetrate—the manures that supply it with food—and the plant itself—its roots, stalk, leaves, sap, flowers, and seed—are chemical compounds; many of them complicated in their nature, and having extensive and abstruse relations. If we take the most simple in this composition. atmospheric air and water, we find them composed of oxygen, nitrogen, hydrogen, carbonic acid, and ammonia, with one or two other bodies which may, perhaps, be considered incidental. These are substances strictly chemical in their nature, and having a range of affinity more extensive than any known in the science. Their affinities embrace each other, and nearly all other elementary and compound bodies. Oxygen, for instance, combines with nitrogen in at least five proportions, besides entering into the composition of the atmosphere; also with hydrogen in two proportions—one of which is water, a chemical agent of great extent and influence; and with carbon, forming two compounds—one of them carbonic acid, sustaining a peculiar and important relation in the nourishment and growth of plants. Combinations are likewise formed with metallic and non-metallic elements by oxygen; it enters into nearly all compounds of animal and vegetable origin, and has a prominent place among the constituents of the soil and manures, indeed, of all the forms and modifications of matter.

Air and water, it is thought, contain a large portion of the food essential to the nutrition of plants. Dr. Liebig, in his "Organic Chemistry of Agriculture and Physiology," has said—"Carbonic acid, ammonia and water yield elements for all the organs of plants. The atmosphere and the soil offer the same kind of nourishment to the leaves and roots. The former contains a comparatively inexhaustible supply of carbonic acid and ammonia; the latter, by means of its *humus*, generates constantly fresh carbonic acid, while, during the winter, rain and snow introduce into the soil a quantity of ammonia sufficient for the development of the leaves and blossoms." Excepting, then, the inorganic elements, which are supposed by him to be of secondary importance, it is the opinion of Liebig that the constituents we have been considering supply in the form of carbonic acid, ammonia and water, the only food of plants. Though this view has been questioned, and, I conceive, justly, by Johnston, it yet remains true by the admission of all chemists, that these three compounds act a very important and essential part in the economy of vegetable life.

Whatever transformations these agents excite or undergo, they seem to be as purely chemical in their nature as the agents themselves. The carbon of the carbonic acid is taken by the plant, and its oxygen is evolved. So the elements of ammonia and water may be used at the pleasure of the plant. Here nothing is observed which may not be seen in all other cases of chemical action. The old body is destroyed, and a new one is formed. The elements forsake their old combinations and enter into new relations. So when a vessel of chlorine is inverted over a warm solution of sal-ammoniac, the explosive chloride of nitrogen is the result, the chlorine and the nitrogen entering into a new relation. Here is a fact which we can explain only by saying that in the peculiar circumstances mentioned the chlorine and the nitrogen are brought together by chemical affinity, while the sal-ammoniac is decomposed. When the carbonic acid comes into contact with the leaves of plants, similar facts are observed: the carbon unites with oxygen and hydrogen to form woody fibre, and the carbonic acid is, of course, destroyed. Why should we say that the transformations are due in the former case, to chemical affinity, and in the latter to some other agency? What is here said of carbonic acid may also be said of water and ammonia.

But whether we attribute these transforma-

tions to chemical affinity, the vital principle, electricity, or any other force, Agriculture is none the less a chemical art. If we wish to know in what circumstances a plant will best thrive, it is necessary that we should ascertain its appropriate food; and, in order to this, what method is likely to be so accurate and effectual as the chemical analysis of the plant itself, and the sources whence its food is drawn? Every plant is composed of the elements of matter which must have been drawn from the atmosphere, from water, or the soil. Transformations have certainly taken place: what was before in the soil or the atmosphere is now a part of the plant, and nothing is found in the latter that has not been received from the former. If we look into the plant, we see what is essential to its nutrition; if we examine the soil, the water, and the air, we ascertain whether these contain its appropriate food: if they do, the plant should thrive without manures; if not, it is necessary to know the composition and action of manures, before its appropriate food can be *intelligently* supplied. Hence we arrive at the conclusion that before we can determine with scientific precision what is necessary in a given place, in order that any plant may be grown successfully, we must know—

1st. The composition of the plant;

2d. The composition of the air and water;

3d. The composition of the soil;

4th. The composition of manures.

The composition of the atmosphere and water in their normal state may be considered constant. Hence, when their constituents have been once correctly ascertained, farther analysis may be dispensed with; but as to plants and soils and manures, their composition varies with time and place. Here it is, especially, that Agriculture requires the aid of Chemistry. Not only must the composition and chemical relations of the atmospheric elements, oxygen, nitrogen, carbonic acid, ammonia and water, be determined—not only must the composition of all plants and of every part of each plant be accurately analyzed—but the varying and complicated nature of soils and manures demand the highest powers of chemical analysis. Human genius may here find an ample field for its exercise. The territory is large and comparatively unexplored. Davy, Liebig, Boussingault and Johnston have surveyed it—have carried through it the compass and the chain; marked its grand divisions and described its general features. A century of human effort will hardly complete what they have begun—will fail to open and cultivate the ground which they have as yet but just surveyed.

To illustrate the views we have attempted to offer, as to the relation of Chemistry to Agriculture, we will briefly consider one or two of our most valuable crops. The following table gives the *general* composition of wheat and oats, according to Boussingault:

TABLE I....Composition of Wheat and Oats.

Composition.	Wheat.	Oats.
Carbon	45·50	50·70
Oxygen	43·10	36·70
Hydrogen	5·70	6·40
Nitrogen	3·40	2·20
Ash	2·30	4·00
Total	100·00	100·00

Confining our attention at present to the four elements, oxygen, carbon, hydrogen and nitrogen, it may be observed that they compose essentially the whole plant, except the ash, which is the product left after combustion. Combining with each other in different proportions, they form all those nutritive compounds, such as gluten, starch, albumen, sugar and the like, which give value to the crops. Hermbstadt sowed ten patches with the same seed of each crop, and applied a different manure to each patch. The seed produced in each instance were analyzed, and the following tables give the results:

TABLE II....Showing the Composition of Wheat and the Effects of Manures.

Composition.	Ox blood.	Nightsoil.	Sheep's dung.	Goat's dung.	Human urine.	Horse dung.	Pigeon dung.	Cow dung.	Vegetable manure.	Unmanured.	Average.
Return	14 fold	14 fold	12 fold	12 fold	12 fold	10 fold	9 fold	7 fold	5 fold	3 fold	9·8 fold
Water	4·3	4·2	4·2	4·3	4·2	4·3	4·3	4·2	4·2	4·2	4·24
Gluten	34·2	33·9	32·9	32·9	35·1	13·7	12·2	12·0	9·6	9·2	22·57
Albumen	1·0	1·3	1·3	1·3	1·4	1·1	0·9	1·0	0·8	0·7	1·08
Starch	41·3	41·4	42·8	42·4	39·9	61·6	63·2	62·3	65·9	66·6	52·74
Sugar	1·9	1·6	1·5	1·5	1·4	1·6	1·9	1·9	1·9	1·9	1·71
Gum	1·8	1·6	1·5	1·5	1·6	1·6	1·9	1·9	1·6	1·8	1·68
Fatty oil	0·9	1·1	1·0	0·9	1·0	1·0	0·9	1·0	1·0	1·0	0·98
Soluble phosphates, &c	0·5	0·6	0·7	0·7	0·9	0·6	0·5	0·5	0·5	0·3	0.58
Husk and bran	13·9	14·0	13·8	14·2	14·2	14·0	14·0	14·9	14·0	14·0	14·01
Total	99·8	99·7	99·7	99·7	99·7	99·5	99·8	99·7	99·5	99·7	99·68

TABLE III....Showing the Composition of Oats and the effects of Manures.

Composition.	Ox blood.	Nightsoil.	Sheep's dung.	Goat's dung.	Human urine.	Horse dung.	Pigeon dung.	Cow dung.	Vegetable manure.	Unmanured.	Average.
Water	12·0	12·1	12·6	12·9	13·0	13·1	12·3	11·6	10·8	10·8	12·12
Gluten	5·0	4·6	4·0	4·3	4·4	4·0	3·2	3·1	2·0	1·9	3·65
Albumen	0·4	0·4	0·5	0·4	0·5	0·5	0·3	0·3	0·2	0·2	0·37
Starch	53·1	53·3	59·0	53·2	53·1	54·5	53·2	55·0	59·9	60.0	54·93
Sugar	3·8	3·8	5·2	5·4	5·0	5·2	5·0	6·8	6·4	6·4	5·22
Gum	5·5	5·4	5·5	5·7	5·7	5·6	6·8	7 3	7·0	7·0	6·15
Oil	0·3	0·3	0·3	0·3	0·4	0·3	0·3	0·3	0·2	0·3	0·30
Soluble phosphates, &c	0·4	0·5	0·4	0·4	0·6	0·5	0·3	0·3	0·2	0.1	0·37
Husk and bran	19·3	19·2	13·3	17·0	17·0	16·0	18·3	15·0	13·0	12·0	16·01
Total	99·8	99·6	95·8	98·6	99·7	99·7	99·7	99·7	99·7	98·7	99·12

These analyses of Hermbstadt may be more or less incorrect, but coming from a chemist of acknowledged skill, they may be considered sufficiently correct for our present purpose. We wish to accompany these tables with some explanatory remarks:

1st. If we except the soluble phosphates, all the other substances in the tables are composed of oxygen, carbon, hydrogen and nitrogen, the first four elements, mentioned in Table I.

2d. The soil in which the wheat and oats were sown had the same composition.

3d. The seed sown were of the same kind.

4th. They were alike subject to the same atmospheric air, the same water and the same climate.

5th. The composition of the ten specimens of wheat in Table II. and of the ten specimens of oats in Table III. varies in a remarkable degree. The amount of gluten in some specimens of wheat is more than three times as large as in others, and the starch of some exceeds that of others by more than one-half. It may be observed, also, that as the starch increases, the gluten diminishes.

6th. The only agency calculated to produce these discordant results is that of the different manures. How these manures act, it is difficult, perhaps in the present state of chemical science impossible, to explain. We cannot ascribe their effects, with certainty, to any peculiar principle contained in the manures; in other words, we cannot assign in each case an adequate cause for the special result. But the effect is sure, and the cause must exist. It can be found only in the peculiar composition and agency of the manures applied to the wheat and oats; and rigid chemical analysis alone must assign with precision the efficient cause in each instance.

7th. By the aid of chemistry we are informed in these tables that a relation before unknown exists between the grain of wheat and oats and the manures applied to the soil. The chemical constitution of the grain, and, therefore, the quality of the flour, depend on the nature of the manure. If this principle be susceptible of general application, it opens to the chemist and the scientific agriculturist a field of great interest and future profit.

I will now briefly consider the ash left after burning the straw of wheat and oats. Sprengel gives the following table:*

TABLE IV...Showing the Composition of the Ash from Wheat and Oat Straw.

Composition.	Wheat straw.	Oat straw.	Ratio.	
Potash	0·6	15·2	25·3	$\frac{15·2}{0·6}=25·3+$
Soda	0·8	trace.		
Lime	6·8	2·6		
Magnesia	0·9	0·4		
Silica	81·6	80·0		
Alumina		0·1		
Oxide of iron	2·6	trace.		
Oxide of manganese		trace.		
Phosph. acid.	4·8	0·2	24·0	$\frac{4·8}{0·2}=24·0$
Sulph'ric acid	1·0	1·4		
Chlorine	0·9	0·1		
Total	100·0	100.0		

These results show that the ashes of wheat and oat straw differ remarkably respecting potassa and phosphoric acid—there being in oat straw more than twenty-five times the quantity of potassa in wheat straw, and twenty-four times as much phosphoric acid in wheat straw as in oat straw—so that these bodies would seem to vary in an inverse ratio with each other. It may be inferred, therefore, that oats will thrive well in a soil exhausted by Wheat.

In Table IV. the constituents of the straw are given without any reference to the manner in which they are combined with each other. The acids and alkalies, or oxides, may form salts, and according to M. Berthier, the following table exhibits the relative proportions of these salts in wheat straw;

* For Tables II. III. and IV. I am indebted to that excellent work, "Johnston's Agricultural Chemistry."

TABLE V....By M. Berthier.*

	Ash of Wheat Straw.
Sulphate of potash	00·4
Chloride of potassium	03·2
Silica	71·5
Carbonate of lime	09·6
Sulphate of lime	trace
Magnesia	trace
Oxide of iron	trace
Oxide of manganese	trace
Silicate of potash	13 0
Phosphate of lime	02·3
Total	100·0

Although the practiced eye of the chemist will readily perceive some disagreement between this Table and the first column of Table 4, he must acknowledge that these salts are purely chemical, and occupy a prominent place among chemical reagents.

From the preceding discussion, (which might be much extended,) we think it must be clear that the relation of Chemistry to Agriculture is intimate and interesting. All the material agents employed in the nutrition and growth of plants have the composition and affinities of chemical bodies. The soil is a mixture of chemical compounds, and so are atmospheric air, water, manure, the seed sown, the plant produced, and the seed gathered. We begin and end the process of cultivation with the compounds and agents well known in Chemistry. These conclusions are true, whatever modifying or controlling influence other mysterious agents, such as the vital power, may exercise over the usual chemical affinities and relations of the bodies employed. In a word, Agriculture is a chemical art.

In any department of Agriculture, therefore, the Chemical Laboratory is needed. It should be amply provided with apparatus and chemical agents for experiment, for illustration, and for analysis.

As Mineralogy and Geology are both intimately related to Chemistry and Agriculture, the Laboratory should be furnished with a cabinet of minerals and a collection of geological specimens.

But Geology is as closely related to Botany, Zoology, Comparative Anatomy, Ornithology, and, indeed, to all the useful and interesting branches of Science connected with the animal and vegetable kingdoms, as that is to Mineralogy, Chemistry, and Agriculture. In connection with the Chemical Hall, ample collections might be made in all the departments of Natural Science.

I have thus briefly considered what might be appropriately attached to the Chemical Hall.—Whatever is undertaken should be devised on a liberal scale. It should be worthy of the princely gift of Smithson—worthy of the great people he honored with his gift—worthy of the Republican character and agricultural interests of a wise and rapidly increasing nation.

In the *second* place, the Agricultural Department should have a sufficient number of well-endowed Professorships, to give instruction in the branches of Science already mentioned.—There should be—

1st. A Professorship of Chemistry, designed to teach the elementary principles of that Science, the art of chemical manipulation, and the best methods of chemical analysis.

2d. A Professorship of Agricultural Chemistry, to be filled only by a thorough chemist and a skillful, scientific farmer. He should teach the principles of Agricultural Chemistry—give instruction in the analysis of soils, manures, seed-plants, and the like—and superintend an experimental farm, which should be connected with his department. In the Professorship, provision might be made, to a certain extent, for analyzing the soils of the farmers and planters of the country, as they might desire.

3d. A Professorship of Mineralogy and Geology, in which these sciences should be taught, both in theory and practice. Minute geological and mineralogical surveys of the adjacent country should be required of this Professorship.

4th. A Professorship of Botany and Vegetable Physiology, organized on the same plan as the preceding Professorship.

5th. A Professorship of Animated Nature, embracing Zoology, Ornithology, Ichthyology, Comparative Anatomy, and their cognate branches of Natural Science. In any of these departments, Assistant Professorships may be added, if they should be found necessary.

I cannot enter into the details which ought to be observed in the organization of these departments; the duties of each should be clearly prescribed and rigidly exacted. The instruction given should be eminently practical, carrying the mind of the learner to the actual observation of Nature, and making him familiar with theoretical and practical Agriculture, and with those sciences to which Agriculture is closely related.

In the *third* place, attention should be given to the formation of manures and the improvement of agricultural implements, and, perhaps, I might add, of domestic animals.

Respecting manures, two things should be specially observed:—1st. Means for testing new methods of forming them and increasing their quantity should be provided on the experimental farm. 2d. Provision should be made for discovering and making known the best methods of preserving all kinds of manures, and especially those necessarily formed on every

* This table is from Boussingault's "Rural Economy," a work both practical and scientific, and worthy of a better English dress than the one given it by "George Law, Agriculturist."

farm, of which the largest and most valuable portion is usually lost in this country.

The implements of Agriculture are as needful to the farmer as the tools of the mechanic are to his trade; and inferior instruments embarrass and hinder the one no less than the other. The enlightened agriculturist is satisfied with nothing short of perfection in the implements and machines used on his farm. Where should he look for aid in perfecting his plow, his scythe, and his machines of all kinds, more appropriately than to the Agricultural Department of the Smithsonian Institution?

Such is the Department of Agriculture I should rejoice to see established in connection with an Institution designed to increase and diffuse "knowledge among men." In the arrangement I have imperfectly scanned, the interests of Science would be amply guarded, and the most important of all arts—the art of Culture—would be enriched with the gifts of Science.

The tillage of the soil is the honorable destiny of the largest part of our race. Hitherto it has been recommended by the independence, the healthfulness, the purity, the quiet, of rural life, and the loveliness of rural scenery. The country has inspired the poet's pen, and furnished the themes of his merriest songs. The peasant's cottage, the stately mansion, the undulating fields, the grazing herds, the waving grain, the laborer's rustic note, the murmuring brook, the woodland songster, the forest foliage, and the flowers—the beautiful flowers—are sacred to the strains of rural poetry. But the dignity and attractions of Science should now be added to the farmer's tranquil and happy home. Within the present century, an agricultural literature has been formed; and the tiller of the soil is expected to read and to think, as well as to plow. Agriculture is progressive. It is now thought possible that a farmer may be wise, and yet decline to walk in the footsteps of his fathers.—And why should Agriculture be stationary?—The spinning jenny has supplanted the distaff; the rail-car outruns the stage-coach, and steam has changed the commercial relations of the world. While the friendly hand of Science is pushing forward the other industrial pursuits of man, shall this alone, which employs and sustains nine-tenths of our race, receive no onward and elevating impulse?

It is moving onward with long and rapid steps. Europe is watching with favor the vast interests involved in the cultivation of the soil, and all ranks are uniting to hasten its improvement. They are actively employed in renovating their systems of Agriculture, both in theory and practice. Courts and nobility are honored to appear at the exhibitions and *fêtes* of Agricultural Societies and Associations; even the favorite Minister of absolute Austria protects with greater care than usual the cause of the plow. Science seeks to contribute its offerings. The Universities of Giesen and Durham, and the princely estates of Bechelbroun and Möglin, are among the distinguished scenes of its European triumphs. Associations for the protection and encouragement of Agriculture have been formed in every part of Great Britain, of France, and the States of Germany; and crowds of the laboring peasantry, the suffering many, aroused from the sleep of centuries—and kings, agents of the privileged few—unite to celebrate the victories of thriving husbandry, and to devise means for increasing the fertility of the soil which even the classic bard of Andes never conceived.

The people of the United States are deeply interested in this subject, and are beginning to feel its importance. The Agricultural Clubs, Societies and Associations recently formed and thickly scattered over the country, from Maine to Louisiana, attest the increased attention bestowed on Agriculture. Though American Science has failed to pursue this subject with its usual zeal and success, the efforts of Peters, Webster, Taylor, Wadsworth, Skinner, Seabrook, Ruffin, and others, have been attended with beneficial results to American husbandry.

With the aid of Science, the improvement of Agriculture among us will be uniform and sure. Not left to chance or luck, it will be directed by knowledge and skill. Science has shed her light on the rugged path of the laborer in almost every other form of industry, and Government has found it profitable to purchase her aid even in determining the nature and relative value of American coals.* Agriculture prays only for equality of benefits, for even-handed justice.—Assistance and guidance are needed. Let Science open the path and set up the way-posts, and the course of American Agriculture, like that of Europe, will be marked by certain and increasing speed. The language of Petzholdt, in his "Lectures to Farmers," is considered just and appropriate:—"When the scientific principles upon which the art of Agriculture depends shall be fully known, and the practice founded on it generally followed, the amount of our present crops will be as much a subject of tradition as the pace of the old stage-coach, which dawdled away *twenty-four* hours in accomplishing a journey of seventy miles, is to the present generation."

The present Congress, if it shall justly estimate the agricultural interests of the nation, and the value of those sciences with which they are identified—and shall see fit, in its wisdom, to es-

* Reference is here made to Prof. Johnson's Report on American Coals—a work creditable to its author and to American Science.

tablish, as part of the Smithsonian Institution, a Department of Agriculture similar to what I have here tried to set forth and vindicate—will bestow great and enduring benefits on the present and future generations, and be entitled to their grateful remembrance and profoundest veneration.

I have the honor to be,
With high respect, yours, truly,
J. W. HARDY.

Randolph, Macon College, Va., Jan. 7, 1846.

AGRICULTURAL EDUCATION.

Extract of a letter to the Editor, dated

"DUBLIN, N. H. Dec. 22, 1846.

"I have read all the numbers of your Library and Journal thus far, and I regard it as a most important publication, and though I am not a practical farmer, yet I am deeply interested in the subject, and hope that your labors will receive such encouragement as to induce you to continue them.

"I rejoice to see that you are resolved to urge the subject of Popular Education in the pages of your Journal. Farmers must be educated, or they will make no improvements. Too many, at the present day, have no taste for reading; they never learned to read with intelligence in their early years, and the consequence is, they regard all books and periodicals that treat of Agriculture as of no sort of value. They *are* of no value to *them*, for they cannot understand, and therefore cannot apply the principles of such works. Science in its applications to Agriculture should be taught thoroughly to all those who expect to cultivate the soil. This may be done even in common schools, but especially may it be done in high-schools and academies. Farmers should insist upon having Agricultural Seminaries, where practical instruction and training may be given in every thing that pertains to the farming interest. If farmers move in this matter, united, and say the word, the thing will be done; legislators will not refuse to enact the necessary laws, nor to withhold the necessary funds."

Acts of legislation and appropriations of public money, for *diffusing education and knowledge immediately connected with practical Agriculture*, are about the last things that enter into the schemes of the partisan legislator. Propose to him something that *smacks of war and bloodshed*—some law that will create new offices to be filled, and a better chance for himself and friends to come in for a share of the public *treasure*—and he pricks up his ears, and looks and listens like a sportsman's dog at the smell or the sight of fresh game. But talk to *him* of establishing a *civil* institution for spreading a knowledge of things that shall enable the *tiller of the soil* to analyze and better understand the value and application of all his resources, and you talk to him about what he does not comprehend, and the extent of all the inquiry he will take the trouble to make is, *How many votes will this measure bring me at the next election?* The only way, then, to cure the evil, and to bring about a course of legislation more conformable with the general interest, is, as our correspondent well says, by farmers' taking the matter into their own hands, and making legislators, who have not the public spirit and intelligence to take the lead, feel that *their popularity* depends on their better appreciation of the solid, substantial interests of society. Why do not all Agricultural Societies begin the work of awakening and reforming public sentiment on this subject? Let them begin by insisting that not *one dollar* be given to an officer of the Army or Navy without at least a like amount being given to the *civil engineer* and the *schoolmaster*. If the people are to be taxed eight millions a year, as now, for the military, let a like sum be appropriated for *good agricultural roads and good agricultural instruction*. Better, much better, for the people—a people boasting of their *republicanism*—to pay for institutions for *spreading knowledge*, than for *shedding blood!* We invoke the coöperation of the general Press of the country.

How differently *they order things in France—monarchical France!*

"AGRICULTURAL SCIENCE IN FRANCE.—Mr. WALSH, in a recent letter from Paris, writes as follows:

"We have regular reports of the sittings of the Convention of the Agriculturalists of the North. The Government lends it all countenance and aid, and manifests a strong desire to establish societies and committees in every district of the realm. A general scheme for this purpose was submitted on the 7th instant to the Convention by the inspector general of Agriculture, and was freely and fully discussed."

POTATO DISEASE.—EFFECTS OF GUANO.

Extract of a letter to the Editor, dated

CATSKILL, Jan. 10, 1846.

Sir: In reading your remarks in your last Library on the experiments about to be tried at Baltimore upon the disease of Potatoes, I thought I would address you a private letter, and give you my experience upon that subject. I removed to this place from New-York last Spring; I leased about twenty acres of land that was not under very good cultivation, but having had an early agricultural education, and an extravagant fondness for it, I made an excellent selection of soil and situation. I have been in the habit for several years past of reading all publications upon improved Agriculture I could find, so that my mind is pretty well stored with the different experiments that have been tried in Europe and America. On my leasing the place, having limited means, I set my wits to work to ascertain what would be the cheapest manure I could use, and decided upon Peruvian Guano, which I purchased of Mr. Bartlet. I then selected as a medium through which to

apply it, the dust and burned earth from charcoal pits, which can be had here in any quantity, delivered at two dollars for forty bushels. The manner of preparing and applying it was by dissolving the Guano in water, as strong as the water would take it up. I then gathered a quantity of rich vegetable mould, that had been accumulated from the wash of a barn for ten years past; I mixed that with the charcoal, and wet the whole compost with the Guano-water as much as it would receive. I let this compost lay about a week, protecting it from rain; and at the time of applying it I mixed it with the insoluble Guano. My method of applying it to corn, potatoes, beets, carrots, and all other roots, was to mark out the land with a small plow for field-crops, and with a hand rake with teeth of a proper length, and such distance apart as was suited to what I planted in the garden.

For corn and potatoes, I put into the hills, before dropping the seed, about as much compost as could be held in one hand; on that I dropped the seed and covered it the usual depth. My corn I soaked in Guano about thirty hours; the solution in which I soaked the corn was as strong as one pound to two gallons of water. One field of corn thus planted came up one inch above ground in thirty hours, which I can substantiate by several witnesses. Neither my corn nor potatoes were planted until after the 25th of May. The growth of them was more rapid than I ever saw before. My corn and potatoes were ripe as soon as any fields in the neighborhood that were planted a month earlier.

I did not have a potato affected with the rot. Other potato-fields in the immediate neighborhood were almost a total failure from the rot. Now, was it the Guano or Charcoal that prevented the disease?

I am preparing, this winter, several different kinds of manure, which I intend to experiment with this year in the same field. The result I will communicate to you in the autumn.

[The coincidence between this case and that mentioned by Mr. Teschemacher, where the guanoed acre of potatoes escaped the cholera, would lead to the conclusion that it was the *Guano* which in this case saved the crop. Should these cases be corroborated by a few others, it will establish for that fertilizer another and a stronger claim on the attention of agriculturists.] [*Ed. Farm. Lib.*

SORE THROAT.—We have known several instances in which this distressing complaint, even in its worst stages, has been immediately alleviated and speedily cured by the following remedy: Mix a pennyworth of pounded camphor with a wine-glass of brandy, pour a small quantity on a lump of sugar, and allow it to dissolve in the mouth every hour. The third or fourth dose generally enables the patient to swallow with ease. [Medical Journal.

THE PROPER POSITION OF COUNTRY DWELLING-HOUSES AND BARNS.

WASHINGTON, 16th Jan. 1846.

To the Editor of the Farmers' Library:

Dear Sir: Your number for this month came duly to hand yesterday, and this evening was dedicated to a *promenade* through its pages, which I did with the delight afforded by beholding improved prospects in the fields of Agriculture and domestic rural life. Though from the vicissitudes of the world, and the little we have it in our power to choose, adopt and follow, and also enjoy our favorite course, I am deprived of even the hope to spend my latter days on that most beautiful of all creations of man, THE FARM, yet there is no other literature I so warmly peruse as that of the farm.

There are several heads of your last number on which I could comment, but in the present instance will throw out a few hints—which you can use, if you think them worthy—on "Farm Buildings." On the mode and manner of construction I shall say nothing, as all these considerations must depend upon local circumstances; but on the position of Dwelling-Houses there is, in my opinion, one great feature of the climate of not North America alone, but of the whole Northern Temperate Zone of the earth, which stands as a permanent law, to decide the question. To place a Dwelling-House with the walls along and at right angles to the meridians of our globe, is almost a matter of course, yet evidently the very worst position possible, when we *consult the prevailing winds*, which if we do, and find that the north-western current of air so far prevails in time and force as to bend, in great part, our forests, and more particularly our orchards, to the south-eastward, can we fail to discover that the farther we deviate from the customary placing of farm Dwelling-Houses, the more sheltered must be the south-east side? Or, in other words, place the side-walls north-east and south-west, and the consequence follows that in the violent heats of our summers, as well as in the beating storms of our winters, one side of the building, that to the north-west, defends and leaves the contrary side a cool retreat from one extreme, and a safe retreat from the opposite.

It would be difficult to discover more than one advantage gained by an east-and-west and north-and-south Dwelling-House: that is, fulfilling, in part, the office of a sun-dial—a dial purchased at an enormous price.

Since commencing these notes, a thought has struck me to furnish you with some plain drawings illustrative of what I have observed, and tables of the winds compiled by various observers both in Europe and America.

It may be observed in closing, at present, that such works as the Farmers' Library and Monthly

Journal of Agriculture have no small part of their value in their tendency to awaken inquiry into customs, of however long standing they may be, and to stimulate society to decide their value not by antiquity of custom, but by tested utility and conformity to the laws of Nature.

We may also extend these observations, and with even more propriety apply them to Barns. If a Barn is built, as it always ought to be, with two wings and an intervening space for threshing-floor, at least ten feet wide, all under the same roof, and placed lengthwise, as recommended for the Dwelling-House, wind-mills would become little more than an incumbrance. If, again, placed on sloping ground, the south-east exposure would afford to stock a like shelter from the winter blasts as promised above to the human. WILLIAM DARBY.

"L' ART DU MARAICHER."

Extract of a letter to the Editor.

"THERE is a subject, entirely new in this country, well worthy of investigation, if you could get hold of a book on the subject '*L' Art du Maraicher.*' You will better understand it by analyzing the word '*Maraicher:*' *marai* means marsh, or swamp; *cher* means dear.

"I have seen it practiced in France, without paying much attention to it. It is, however, a system of cultivating vegetables based upon large supplies of water; and this water is always obtained from wells by means of horse-power, driven by one horse. You can imagine what a fat, rich soil would do for us if always moist, when the thermometer ranges from 80 to 100, as it usually does here in summer.

"In England and France, owing to more moisture, they greatly excel us in the production of vegetables. Give us the moisture, and with our hot sun we can greatly surpass them. Near Paris, the horse that draws the water does all the other work about a vegetable garden.

"You want a paper on the cultivation of *liquorice*. Large quantities of it are reared in France in the latitude of Paris and farther south. You might learn something of it in New-York from the large druggists. That used in this country is, I think, all imported.

"*Irrigation* is another subject of great importance. In Italy the subject is so important, and the practice so universal as to require separate and special legislation. The day may be remote, but we will get to it eventually in this country. F. G. S."

NOTES ON THE ABOVE.—There is, indeed, room for inquiry and need for information about Liquorice. We import it all; and if it were not the product of *agricultural* labor, the home growth of it would doubtless be well protected; but farmers are the last of all classes to look after their particular interests and to see that they are provided for in the legislation of the country. Their Representatives are, for the most part, small politicians who regard their place in Congress as *an office*, in itself if they happen to be in the minority; and if of the dominant party, then they use it as a *stepping-stone* to office for themselves, or as affording them something to give in exchange for Executive favors to their families and friends. As *popularity*, not the permanent public interest, is, for the most part, the question with them, the only way to insure broad-bottomed, enlightened legislation, based on the welfare and true glory of the country, is to have an *educated, enlightened constituency*. But how is that to be obtained? The dear people will submit to taxes, and pay any thing that is demanded of them for *military* institutions and instruction; they will go down on their knees the more conveniently to take up *that* burden, under the charm of the drum and fife! But, with all their instinctive apprehension of what is popular, of what will "*please the people*," do you ever see a Congressman proposing money or voting money for any road but a *military* road—for any school but a *military* school? Oh no, not he! He knows too well what will "go down at home"—what will please in Buncombe.

Liquorice *root* is sold in New-York for five cents a pound; the extract is fifteen cents. The chief supply is from Marseilles; the best from Spain—hence the famous "Spanish Liquorice." We wish our correspondent had the books, or that we had the time to look farther into this matter.

For Irrigation and Water Meadows.—We indicated our estimate of the importance of these subjects in an early number; and on page 463 (this month's issue) will be found an article on FLOODING MEADOWS. But these processes are very expensive where labor is so dear.—Yet, there are thousands of streams of water that might be used with great advantage and profit, that are now unused. We have as much of what we esteem to be very valuable matter, as will fill the March and April numbers; but all printed and selected articles are liable, before they are in type, to be superseded by original communications, and even to be postponed after they are in type, where circumstances require it. We solicit and give preference to original correspondence on subjects decidedly new and important; but we do not wish to tax our readers with pages of mere twaddle—old details reproduced; old stories vamped up, and stale subjects revived, or humbugs, such as "calico-corn," that serve, like June-bugs tied by the leg, to amuse, for the moment, men who "are but children of a larger growth." [*Ed. Farm. Lib.*

INDIAN CURE FOR THE SORE THROAT.—Three or four salt-water clams split and bound round the neck wher swollen and inflamed, with a cloth, will effectually cure this disease. The clams to be renewed every four or five hours.

RAISING POTATOES FROM SEED.

BY THE EDITOR.

WASHINGTON, 28th Jan. 1846.

Chevalier Fs. W. M. DE TESTA,

Chargé d'Affairs, &c. from the Netherlands:

Sir: In reference to the seed of the Potato, about which you honored me with inquiries, they have never been preserved, as is believed, in sufficient quantity to be a *marketable* article in this country; in fact, they have been *very rarely* saved by farmers for their own use; and to this may be attributed, in some measure, our want of new and good varieties. The eager temper and impatient habits of our people, their love of change, and propensity to migrate from place to place, produced in a great measure by the frequent and infinite division of estates and impoverishment of families, prevents the adoption, in agricultural matters, of *means* to *ends* which require years of patient attention before these ends can be consummated. Hence the destitution of the country, since the establishment of our independence, of fine orchards and of choice fruit, the possession of which, under the most favorable circumstances, requires years to realize, and which, after all, is only to be had, with certainty and abundance, by raising new varieties of fruit from the stones and seeds of peaches, apples, pears, &c. So with the Potato. The *seed*, as you well understand, is to be had from the Potato-*apple*, growing on the *top of the plant*. As in the case of fruit, there is no security in this that "like will produce like." The product from Potato-*seed* is various in color, shape, and qualities, and some years must elapse before the best varieties can be *established* and their qualities considered permanent. For this reason, no seedling Potatoes should be discarded till after trial of the third generation, nor a promising one be sooner trusted. It is only after the third year that full reliance can be placed on the permanence of characteristics as respects productiveness and other qualities.

The characteristics to be sought in the establishment of a new variety are—1st. Moderate size, which I am persuaded, on the whole, is most to be desired in animals, fowls, vegetables, &c. 2d. Regular shape; the eyes not deeply sunk. 3d. Not bursting when boiled. 4th. Dry or *mealy* when cooked. 5th. An agreeable taste. 6th. Early in maturity. 7th. Not too luxuriant in the stems. 8th. Productiveness. As with fruit from stone and seed, so there is no end to the varieties of shape, size, colors and qualities to be derived from the seed of the same Potato-apple. The roughness of the skin generally indicates dryness, the watery or waxy Potato being commonly smooth-skinned. Thirty seedling varieties have been gathered from spontaneous seedlings in a garden where only one kind of Potato had been planted. There is no fact in vegetable physiology better established than that *soil* has a powerful influence in changing the color, shape and qualities of the Potato no less than those of grain and tobacco. I observed this in the case of the famous *Rohan Potato*, one of the humbugs which a few years past served to amuse a credulous public, so that it sold in Philadelphia for $1 for a single tuber. The imported root was very large, and the quality waxy and coarse. In two generations planted on stiff white-oak land, manured, it yielded a very fine, smooth, middle-sized Potato, excellent for table use. It is clear, then, that every cultivator should raise seedling Potatoes until he establishes a variety suited to his soil, and one which he may then expect to endure.

Nothing in the annals of American Horticulture is better established than the origin of the "*Mercer Potato*," raised from *seed* planted in Mercer County, and regarded as one of the best and most popular varieties we have ever had.

There is no reason to believe that better Potatoes could be had from seed in this country than in Europe; nor is it probable that they will ever be saved in sufficient number to be on sale in the seed-stores. There is nothing more necessary than to gather the apple when ripe, separate the seed from the pulp, or perhaps to express the watery particles, leaving the seed in the residuum of the apple, and to preserve them until time for planting, which had better, in the first instance, be in a hot bed.

According to promise, I send you the February number of the Farmers' Library, (a monthly periodical devoted to Agriculture and its kindred studies and sciences,) with the dissertation of Professor MORREN on the origin of the Potato Disease, and would be gratified that he should know that, according to his wish, it has been published and spread before the cultivators of that valuable and important esculent in this country, but which our great staple and popular food, *Indian Corn*, renders of less material importance in this country than in those parts of Europe not suited to the growth of *maize*. If, sir, I can be at any time of any service in the interchange of agricultural knowledge or products between our countries, I pray you to rely with confidence on the humble instrumentality of one who can never be more happily employed.

With great respect, Sir, I have the honor to be your ob't serv't,

J. S. SKINNER,
Edit. Farm. Library.

KITCHEN PEPPER.—Ginger 1 lb.; cinnamon, black pepper, allspice, and nutmegs, of each 8 oz.; cloves 1 oz.; dry salt 6 lbs. Grind together. Useful to flavor gravies, &c.

[Cooley's Cyclopædia of Prac. Receipts.

PREPARATION OF SEED-CORN.

Important Suggestions.—Use of Copperas Water in the Preparation of Seed-Corn; By LANSING WETMORE, *of Penn.*

I BELIEVE you are apprised of the fact of my removal from the village on to my farm one mile above, on Conewango Creek. I am in the "full tide of successful experiment" on the new and most approved method of farming. I will communicate for the Farmers' Library an experiment which I made last season in raising Corn. The first of March last I commenced extracting pine stumps from a five-acre field. I had attempted to crop the field twice within the last five years. The stumps were so thick, however, there being about twenty-five on an acre, that the attempt was nearly fruitless. The first crop was oats; the yield was less than 12 bushels per acre; the next, spring wheat, and the yield less than 6 bushels per acre. I seeded it to clover and let it go to pasture—very poor at that—for the last three or four years. With the aid of Norcross's stump machine, which is one of the best and cheapest ever invented, my son, a lad fifteen years old, one horse and yoke of cattle to move the machine, we cleared the field of stumps by the first of May; made some 40 rods of first-rate fence with the best of the stumps, and burned the rest; drew on 12 loads of long manure per acre, spread it, and plowed it 7 inches deep; dragged it with the furrows; marked it off and planted 3 feet asunder each way. The produce of the five acres was 553 bushels of corn in the ear, 3000 pumpkins, and 25 bushels of excellent potatoes. My corn crop was increased about 33 per cent. by a simple preparation of the seed as follows:

At noon of the day before planting, 18th May, I put my Seed-Corn to soak in a strong decoction of copperas water, say 2 lbs. copperas to warm soft water sufficient to cover a bushel of corn. The next morning took out a peck, added a pint or more of soft soap, stirred it thoroughly, then put on plaster enough to make it convenient to drop for planting, say one quart. The whole field was planted with the seed thus prepared, except 4 rows, which were planted with seed without any preparation. The after-culture of the whole was alike—passing through each way with the cultivator, and hoeing twice. The four rows last mentioned were cut up, harvested, and the corn weighed and measured by itself; also four rows next adjoining, the seed of which had been prepared as above. The produce of the four rows of unprepared seed was eleven bushels and a half. The produce of the four rows from the prepared seed was seventeen bushels—a difference of five and a half bushels of ears in one hundred and twenty hills. The yield of the remainder of the field averaged fully equal to the four best rows measured.

The difference in the growth and appearance of the corn of the prepared and unprepared seed was striking from the time of its appearance above the ground until it tasseled—the former looking green and vigorous, the latter puny and yellow. It was all cut down by the frost when about three inches high, but came on finely after the first of June. There was scarcely a soft ear in the field, excepting on the four rows of unprepared seed. These were about a week later in ripening than that from the prepared seed. The soil is a sandy loam. The whole expense of preparing the bushel and three pecks of seed did not exceed 62½ cents. The increased produce of the field by preparing the seed was over 200 bushels ears.

LANSING WETMORE.

TO HAVE EARLY POTATOES.

THE destruction of the Potato crop in England had been so extensive as to make it proper to look ahead for the best means of hastening the crop forward in the Spring, it being important to shorten as much as possible the period of privation.

With a view to bring forward the next spring's crop at the earliest possible moment, the following suggestions have been made in the London Gardener's Chronicle.

Though not pressed by the same urgent necessity in this country, these suggestions may yet furnish hints to those who feel an ambition, both innocent and commendable, to have the earliest Potatoes on their own table—an ambition that deserves to be fostered, so long as it does not proceed from avaricious motives, or degenerate into envy of those who are winners in the race.

The writer recommends that recourse be had to the earliest known *varieties*, and then to keep in mind the following important facts, and the same general rules may be observed to get early sweet Potatoes:

1st. The eyes at the top of the Potato are the youngest and vegetate first; from them the crop will be about a fortnight earlier than that obtained from the lower part of the tuber.

2d. When the Potato is not cut, and the top eyes are allowed to proceed in their growth, the others push slowly, if at all.

3d. If the top sprout be removed, the other eyes will begin growing with greater vigor.

4th. It is, therefore, obvious that the top sprouts may be removed when they begin to show roots, and planted out for the earliest crop; whilst the rest of the tuber may be allowed to push the other eyes for a succession.

5th. In case of a scarcity of sets, the stems may be layered; they will root, and form a second crop of tubers; but this must be done early in the season, or before the first set of tubers is fully ripe, although large enough to be fit for use.

Men who are skillful propagators of plants (as many gardeners are, and all ought to be) will readily imagine what important advantages may be taken of these properties of the Potato. We

have long since been told that a Mr. DENSON, in 1833, propagated from three tubers plants enough to crop half a rod of ground, and obtained from them an amount of produce equal to 16 tons per acre, in the same season. What may not be expected now, with the invaluable aid of cheap glass!

In the mild climates of Cornwall, Devonshire, and many parts of Ireland, Potatoes may be immediately sprouted in a warm place, as in a cottage near the fire, or on hurdles in cow-houses, &c.; and when the sprouts are two inches long, they may be cut off, together with a portion of the tuber, and planted out in a sheltered spot, covering the sprouts with two inches of light soil. A slight covering will be sufficient to protect them from such frosts as occur in those parts in ordinary winters. They will produce a crop fit for use in the beginning of May.

In cold situations, and where proper protection cannot be afforded, it may be advisable to defer sprouting the sets till the end of January. They may then be pushed four inches by the middle of March, and planted out as soon as the weather will permit.

In planting for the earliest crop, advantage should be taken of the most sheltered situations, such as the south side of walls, hedges, or fences. Where no such shelter can be obtained, ridges three feet apart should be formed, running east and west, and a furrow should then be made along the base on the south side for the dung, over which the sets should be placed, so that their tops on pushing, may appear half way up the side of the ridge. In such a position the roots derive warmth from the rays of the sun striking perpendicularly against the slope; and the top of the ridge affords shelter from northerly winds. If in addition furze, broom, straw, bunches of beech, spruce, &c., are stuck in the top of the ridge so as to project over the young plants, slight frosts will not injure them. If the soil about the plants can be covered with litter in cold nights, radiation of heat will be prevented; the litter should be removed during the day, and the surface frequently stirred. By these means an early crop may be taken off the ground in May, after which there is still time for a second crop.

SCHEME OF REDUCING THE QUANTITY OF COTTON.

REPORT OF THE COMMITTEE APPOINTED BY THE STATE AGRICULTURAL SOCIETY OF SOUTH CAROLINA TO TAKE INTO CONSIDERATION THE SCHEME OF REDUCING THE QUANTITY OF COTTON, SUGGESTED BY COL. DAVIE, AS A REMEDY FOR LOW PRICES.

ACCIDENT has delayed until now the publication of the following Report. It was not until the *February* number of this journal was in the hands of the stereotyper, that we received the copy of the Southern Agriculturist which is now used.

The additional facts here appended to the Report, go farther to show the falsity of the popular belief that the production of Cotton exceeds the consumption. These facts are drawn from the Report of the Committee of Commerce of the City of Charleston, on questions propounded by the Secretary of the Treasury, made to that officer on the 13th of November last.

J. B. O'NEALL, whose name is associated with Mr. SEABROOK, is a Judge of the Court of Common Pleas, and one of the most active and devoted friends of Agriculture in South Carolina; while Mr. S. himself is familiarly known to all as among the most enlightened and prominent friends of that branch of national industry.

We hail it as an evidence of a more lively and extended appreciation of a common interest among agriculturists, and the harbinger of a resolution on their part to protect their interest against ceaseless encroachments of parasitical classes, that the State Society of South Carolina, at its last session, should have instructed its Executive Committee to invite the State Agricultural Societies of the Union to attend their next annual meeting by delegations, who are to come prepared with written answers to such questions as may have been propounded to them in relation to the Agriculture of their respective States.

It will be lamented that his convenience has not allowed Hon. J. C. CALHOUN to comply with the request of the Society to deliver the next Annual Address. Mr. Calhoun has the reputation of being one of the very best practical planters in the country; but we hold that (whatever may be thought to the contrary) to be of less importance, on these occasions, than that the Orator should possess enlarged and comprehensive views of the political rights of Agriculture, and its connection with and paramount influence upon the destinies of the country—its right to a leading control over its legislation, and its liability to be postponed and made subservient to other and inferior classes and professions, whose social relations are more condensed—whose sympathies are more perfect—whose plans are more selfish, and whose concert is so much more complete.

Mr. MADISON was not a money-making farmer, yet his Address delivered before the Albemarle Agricultural Society, of which he was President, and published in the old American

Farmer. may be referred to, even now, as a model for such performances. The same may be said of Addresses by the late R. G. Harper and N. Biddle, and others of their high order of intellect.

The State Society of South Carolina having, by resolution, requested Mr. Seabrook to communicate to the public, before the planting season, such information as he may possess, or as it may be in his power to collect, in relation to the *means of modifying the effects of drouth on Indian Corn and other provisions*, all who possess any facts worthy of notice, that may cast light on the subject, will feel it to be a patriotic duty to contribute them through an organ so well qualified to make the best use of them. The inquiry has been suggested, we need hardly add, by the disastrous effects of the drouth of the last summer in that and other States—making it highly important that full and accurate information should be collected and disseminated.

REPORT ON THE SCHEME OF REDUCING THE QUANTITY OF COTTON GROWN.

The Committee to whom was referred the communication of Col. Davie, addressed to Hon. Geo. McDuffie, W. McWillie, and W. B. Seabrook, report—

That they have considered Col. Davie's scheme of a combination among the Cotton planters, to reduce the quantity planted, and thus enhance the price. They regard it, in the first place, as impracticable. The habits of planters are those of separate action: they combine less than any other class of men. Each regards his plantation as his empire: he looks around and considers what will best promote his individual interest; and though there is no doubt that many might be induced to meet, consult, and possibly write in favor of Col. Davie's project, yet some, and probably a great many, would prefer separate action, and thus destroy the scheme in the very outset.

The vast number of persons engaged in planting Cotton in the Southern and South-Western States, renders the whole project impossible.—What may be our itnerest in South Carolina, might not, and very probably would not, be the interest of the planters in Alabama, Mississippi, Arkansas, Louisiana, Florida and Texas. Their means of raising immense crops make them insensible to *that* which presses upon us with so much severity.

In the second place, your Committee are persuaded that, if such a scheme were practicable, it is by no means desirable that it should take place. For, in its most favorable action, it would in the end operate very much to the injury of the Cotton planters. If, by a reduction of one-half in the production, the price be raised one or two hundred per cent., the next season the quantity raised would be greatly increased, which would again reduce its value to a ruinous extent. Nothing can have more disastrous effects upon planters than this fluctuation from low prices to high, and from high to low. All which is necessary to our prosperity is a diminution of our wants, and a near approach to certainty in the market value of Cotton. Whether it be high or low is of little consequence. Every thing will soon conform to it. From the cheapness and superior quality of our Cotton, it has possession of the English manufactures in the ratio of nine to one. In the course of a few years, if we continue to increase the quantity, we shall, in a corresponding increasing ratio, diminish the production in East Indian and South American Cotton, and, at length, fairly drive all competition from the field, and thus secure a monopoly of Cotton in the markets of the world. This will give security to our domestic institutions. For, as soon as the world feel that they are dependent on us for the Cotton manufactured and worn by its millions, there will be no disposition to take from us our laborers, and thereby prevent the supply of so necessary an article.

But if we do not grow the quantity now exported, and keep pace with the increasing population and consumption of the world, the vacuum will have to be supplied by other nations. On looking at a statistical table, hereto annexed, it will be seen that almost every bale now exported is annually consumed in manufactures. This being so, it follows that the supply by us, or others, must meet the demand. This may be illustrated by reference to the state of things in the British West India Islands. The act of emancipation withdrew an immense amount of effective labor from the cultivation of sugar: it of course diminished the supply from them, but increased it in Demarara and Louisiana. The object of Great Britain in liberating her slaves was to pave the way to general emancipation in the West Indies and North America. So far she has failed in accomplishing it; and indeed, at present, it looks, from her importation of Africans and East Indians, as if she was half way repenting her folly. But we can render no more efficient service, in accomplishing her cherished object, than by diminishing our production of Cotton. When we shall do so, her East Indian provinces will come into the market, and supply what we have failed to do.—Let her once turn the current of trade, and give the monopoly to the East Indies which we now have, in a short time we shall be driven from the field, and then where is slavery? Our negroes will be valueless, and a burden; and, of course, their owners will cease to hold them.

Your Committee are fully convinced that there is not now, as is supposed, an over-production of Cotton; for there cannot be an over-production of an article which is annually consumed. That this is the case with Cotton appears from the statistical table.

The situation of distress in which we have been, and possibly still are, is not the result of over-production. It resulted from the visionary speculations of great financial and commercial schemes. Many indulged in fancies illusory as the South Sea scheme, and to the full as impossible, as the discovery of the famous *el dorado*. Such men gave to every thing a fancied value, which increased as their imaginations expanded—credit was unnaturally extended, until debt exceeded every possible means of payment.—Hence the revulsion of '37 and '38, and the prostration of much real, but more fancied wealth.

At the present moment we are recovering from *that*, by natural and proper means. Our Cotton at low prices is paying annually our debts, and compelling us to reduce our luxuries, and to pursue a just economy. The currency is gradually expanding through the operations of our well-regulated banks, so as to meet the wants of the people, and had it not been for the unpre-

cedented drouth and consequent loss of crops, wherewith it has pleased God to visit us, we should, in the next year, have reached a point of comparative safety and ease from the past pressure.

The extension of the production of Cotton is met by a corresponding demand. Nearly one-half of the population of Europe, especially France and Germany, have not now the comfort of a cotton shirt or cotton jacket. It has, therefore, this field as an untried market, but one which is every day opening more and more to our enterprise. To this must be added, that perseverance on our part will drive all competitors from the field, and when they turn their attention to some other branch of business, they must become our customers. Our American Cotton, and very probably our American Manufactures, are in time, and that a very short one, to be used by every civilized inhabitant, and also many a savage one, of the world.

But if the production of Cotton in the North American States was diminished one-half, the amount of misery which it would cause can hardly be realized. The cotton planter supports millions of human beings, and clothes hundreds of millions more. Let him extend his philanthropic labors; he will be benefited by them: and countless thousands will call him blessed. *At this time*, every indication points to an increase of price, such as the opening of the Chinese trade, the general soundness of the Currency, abundance of poor in England, the possible repeal of the duty on raw Cotton in every country, arising from competition among the manufactures, and the unprecedented demand for machinery in England, on the Continent, and in this country. To these encouraging circumstances it must be added, that probably the Tariff which has been to us the *source of so many troubles*, will, in a short time, come down to the Revenue standard. The evils under which we labor are not those of over-production. They arise from two other causes: one is that of over-legislation. Give us free trade—abolish the unnatural burdens which nations have imposed upon one another; in a word, let the planter be free, and his comforts would soon be duplicated. If the grower of Cotton could send his crop of Cotton to any part of the world, and receive in exchange for it commodities subject to a moderate duty, your Committee believe that the demand for American Cotton would be increased to four millions instead of two millions of bales. This we would be unable to furnish, for the land adapted to its growth is greater in quantity than will ever be cultivated—*the number of laborers is limited.* Unless the African slave trade be again opened, or the introduction of slaves from the West Indies be permitted, (of which no one dreams,) an increased cultivation can only arise from the withdrawal of laborers from the cultivation of rice, tobacco, and sugar, (than which nothing is less probable, especially in reference to the latter article,) an increase in population, and improved modes of cultivation. These sources of an increase of production are so limited that they never can meet the demand which would arise from free trade. We agree with a late writer, that "the American Tariff is the origin of all the hostility of foreign nations to the institutions of the South." It is clear to our minds that there can be no improvement in the business of planting until this unnatural hostility and its cause be removed. For every Southern planter feels his want of security; and the effect of this is increased upon him by the belief, in the non-slaveholding States, that slavery is to soon perish by its own weight. Let him and all others feel that he is secure in his property, and it will quadruple his energy and success.

Another cause of our distress is that, in a large portion of the Southern country, Cotton is cultivated, when its production does not now, and never can, at all compensate the planter for the labor bestowed. *Then* it is desirable for every one that other branches of industry should be pursued. In such sections, manufactures may be most profitably substituted; and every manufactory established will be not only additional wealth to the proprietors and the country, but will also materially aid the cotton planter by increasing the consumption.

We do not intend to encourage the cultivation of Cotton to the neglect of the other products necessary to support or comfort. Every planter should promptly render himself independent, in reference to those articles which could be produced on his plantation. In this way he would profitably curtail the quantity of land devoted to the cotton crop. An abandonment of the present extremely defective mode of culture, and the substitution of a better, would ensure a larger quantity of Cotton than would be lost by diversifying the products of industry. In other words, his cotton crop would be larger; his corn, wheat, rice, oats, barley, horses, mules, hogs, cattle, sheep, butter, and vegetables, would be the produce of his farm.

If, however, the cotton crop is to be given up one-half, after all the reductions of it which we have sanctioned, to what else can the planter of the South so profitably turn his attention? To grain? He already, *in ordinary years*, produces twice as much as the Middle States, and about one-eighth more than the West. In Indian corn alone, the produce of the South, by her last census, was 300 million bushels. If the planter of Cotton is engaged in an unprofitable business, much more is the grain raised. The interest on capital invested in Agriculture at the North is less than three per cent.; *here* it is about four per cent That the rice and tobacco culture might be profitably extended in this State, and will be in the South-West and Texas, is true. Millions of acres in South Carolina, including the lower country, are admirably adapted to the raising of rich grasses. This might be added as another branch of industry, from which reasonable profits could be realized, and might very well be added to the cotton planters' income. The business of tanning and the manufactures of leather might be and ought to be enlarged. In this State, all the means of a successful pursuit of this branch of industry are at hand and within the reach of every one. Hides, lime, bark, and mechanics, (slaves,) are abundant—A few years ago, the capital engaged in this branch of industry in Massachusetts was $14,000,000, while that of Cotton was $13,000,000, and wool less than $11,000,000.

Another great inducement to South Carolina to persevere in the cultivation of Cotton (where, in reference to quantity, it can be advantageously grown) is that it is now highly probable that very many planters in Mississippi, Louisiana, and Texas, will in future direct their attention to tobacco and sugar. Their lands are well adapted to these productions, and the reduction of the duty on American sugar in Great Britain is one strong reason why the culture should be extended.

For these reasons, your Committee disapprove of any scheme which would have a tendency to materially abridge the quantity of Cotton produced. Indeed, they trust that it will continue to increase, and carry its blessings as it were on the wings of the wind, until every inhabitant shall fully realize the benefit of cotton fabrics for all the purposes to which wool, flax, silk and hemp, have been heretofore devoted.

WHITEMARSH B. SEABROOK,
JOHN BELTON O'NEALL.

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Col. M'Willie's absence from South-Carolina, and Mr. M'Duffie's ill health, prevented the Committee from enjoying the benefit of their services and counsel. Mr. Alston concurs in the entire report except a single sentence: and his reasons for that dissent are appended.

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I concur in the opinion that Col. Davie's plan of reducing the cotton crop, by obtaining an agreement among the planters to plant one-half or two-thirds of a crop, is impracticable.

I also believe that it is the true policy of the Southern or cotton growing States, to retain, by all means in their power, their ascendency in the cotton markets of the world, and to do nothing calculated to encourage the extension of the owth of Cotton in in other portions of the world.

I however, disagree to the opinion that "there is not now an over-production of Cotton." I am inclined to believe that the low prices are to be ascribed *mainly* to the heavy crops. It is familiar to all who have been in the habit of attending to the accounts brought from Europe by the different arrivals of vessels, *that the prices there are controlled principally by the latest accounts* from this side of the water, *of the prospects of the coming crop, or the probable amount of the supply of Cotton* from the United States. If the latest accounts from America had been, that the prospect was good, or in favor of a large supply, then the prices there (in Europe) fell, and *vice versa*.

And these accounts from America seem to have a greater control than all other causes combined. The reduction of price of the raw material induces, to some extent, an increase of the consumption, by enabling the manufacturer to make and sell the manufactured goods a little lower. But when we consider how little must be the cost of the raw material contained in a yard of heavy cotton goods—even at 10 cents per pound of the Cotton, we cannot suppose that the price of the raw material can have much influence in increasing or diminishing the consumption, unless the price should be much higher than it has been for many years. Take the cost of the raw Cotton in a yard of manufactured cotton goods, (even at 10 cents per pound,) from the price of that yard of goods, and it will show, that if the consumption is governed by the price of the manufactured goods, it is mainly by the cost of the manufacturing—not of the raw material.

It seems to me that if the consumption kept pace with the production, the price would not be affected by it either way, to any great extent; but that if the manufacturer had always found a ready market for his goods, he would have continued to purchase the Cotton at the usual price, and therefore there would be but little variation in the price of Cotton. On the contrary, however, the manufacturer could not obtain a market for his goods—they would accumulate upon his hands—he would be compelled to reduce the wages of his operatives, or stop his manufacturing machines. He could not afford to buy Cotton any longer, unless at reduded prices, and in less quantities. There being difficulties in getting off manufactures, unless at reduced prices, a like difficulty in selling the raw Cotton would be produced, unless at reduced prices. The prices then must come down.

I will not extend my remarks. The report, in other respects, I concur in. I would prefer that portion, or sentence, stricken out, as I am inclined to thing that its omission would not be inconsistent with the rest of the Report.

Respectfully,
W. J. ALSTON.

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[The cotton crop of the United States, of 1844, was 2,400,000 bales—the largest ever made; notwithstanding, the stocks in the American ports on the 30th of August, the end of the cotton year, were less than they were on the 30th of August, 1844.....65,646 bales.
By the last dates from Havre, the stocks of American Cotton were less than last year at the same time.....19,500 "

85.146 "

In Liverpool, they were more than at the same time last year.....64,300 "

Making a deficiency in stock of...20,846 bales, as compared with the same periods of 1844, notwithstanding a crop of 2,400,000 bales.

The stocks in the other Continental ports cannot be stated, but they are not large. The stocks in spinners' hands in France are moderate. In England they are large, but much smaller, compared with the extent of their trade, than it was their practice to hold some few years since. It is not unreasonable to assume, therefore, that had not the consumption been curtailed in the United States, by the excessive duties on imports, and more especially those on the coarser kinds of cotton goods, the consumption of Cotton at this time, would not only have been larger, but quite sufficient to have kept pace with the production, without the disproportionate decline in price that has taken place between it and the articles manufactured from it.]

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Import of Cotton, expressed in 1,000s of bales.

From	1841.	1842.	1843.	1844.
United States	1,387	1,534	1,904	1,682
Brazil	100	104	115	123
West Indies	72	72	49	47
East Indies	324	316	227	299
Egypt	123	108	469	126

Stocks imported, and consumption of Cotton in Europe, reduced to bales of 300 lbs. each.

	Imports.	Consumption.
1841	2,291,010	2,215,026
1842	2,477,266	2,422,926
1843	2,949,000	2,654,000
1844	2,736,843	2,667,469

From the above, it appears that in 1841, the imports exceeded the consumption, 75,984; 1842, 54,340; 1843, 295,000; 1844, 69,374 bales.

Stock 1st of January.

1841.	1842.	1843.	1844.	1845.
777,610	863,421	926,102	1,239,000	1,321,726

Total deliveries, from which are deducted intermediate shipments, or surplus of exports from

Great Britain; also the stock on hand, 31st Dec., and to which are added the stock on hand, Jan. 1st, expressed in 1000s of bales:

1841.	1842.	1843.	1844.
1,846	2,005	2,155	2,127

Importation.—It will be seen (says the Circular,) that there is a decrease from the United States of about 200,000 bags, and from Egypt of 60,000 bags, whilst from the East Indies is an increase of 55,000 bags, and a trifle from the Brazils, which leaves, on the aggregate, a deficiency of about 200,000 bags; but the excess in the stocks at the beginning of the year, made up the aggregate supply fully to what it was in the previous year.

[The above is extracted from the Circular of Collman and Stotterfoght, dated Liverpool, 31st January, 1845.] [*Columbia South Carolinian.*

SOUTHERN HEMP, OR BEAR GRASS.

We find in the Tallahassee Floridian of the 15th (says the New-Orleans Bulletin) the following letter from Gov. Call to Gov. Moseley, in relation to the cultivation of Hemp from the plant known by the name of Bear Grass, and indigenous to the Southern States. The Floridian introduces the letter with some remarks on the agricultural advantages and the products of Florida, from which we give a short extract:

"We have heretofore remarked that we believed there was no country under the sun where the honest, industrious cultivator of the soil could obtain a living with more ease and less labor than in Florida. We are every day becoming more and more convinced of this fact. The salubrity and healthfulness of the climate, the richness and fertility of the soil, the variety of productions, and the ease with which they can be cultivated, all prove this. Almost every year we have a new article introduced in the cultivation, which has been neglected or overlooked for years past, in the all-absorbing mania for raising cotton. In some parts of the Peninsula we can raise most of the tropical fruits in perfection; in all parts many of them: and in quantities, if the culture is properly attended to, to render their production profitable. With the people of Florida, then, there is no necessity of confining themselves to one particular. We have before noticed some of the most profitable productions—cotton, sugar, tobacco, &c. We have this week a new article to notice, which has heretofore been neglected—the Bear Grass. We have been informed by an intelligent merchant of St. Marks that, a year or two since, he received and forwarded cotton from a Georgia planter, roped with the rope made on his own plantation from the Bear Grass; and that but for the fact that it was not quite so well manufactured, it would not have been distinguished from the regular Manilla."

Tallahassee, Nov. 8, 1845.

To his Excellency, Wm. D. Moseley,
Governor of the State of Florida:

Sir: I have the honor to present to your Excellency a specimen of the Florida Hemp, produced from the plant generally known by the name of "Bear Grass." It abounds in Florida in its native, uncultivated condition, and it is believed that it may be propagated to an indefinite extent. Nothing feeds upon it, and it therefore requires no enclosure. It grows in the forest frequently to the hight of three or four feet, and, no doubt, may be improved by cultivation. It loses scarcely anything by the process of manufactory—the Hemp being about the same length as the leaf. It is found indigenous in most of the Southern States, and, though being neglected and unnoticed, from the successful results of experiments recently made, I feel assured it is destined very soon to become one of the most valuable staples of our country. In the present depressed situation of the cotton market, owing to the superabundant production of that article, such a result is greatly to be desired. And if my anticipations are realized, the Southern Hemp will become more abundant and more profitable than that of the North, and will contribute but little less than cotton to the population, wealth and power of the Southern States.

The resemblance of the Hemp of Florida, both in its native condition and after its manufacture, to that of Manilla, induces a belief that it is equal in value if not superior to that article, and that the same process may be required for its cultivation and preparation for market. Although I am well satisfied with the result of the experiments I have recently made for the latter purpose, and am convinced that, without any improvement whatever in the method I have pursued, the labor of every hand engaged in its production will be more than twice the value of the same amount of labor employed in a cotton field, yet it may be found, on inquiry in the country where the Manilla Hemp has been produced for so many years, that a much better plan has been produced by long experience. Deeming this a subject highly worthy of inquiry, I would respectfully suggest to your Excellency the expediency (should you think favorably of the proposition) of requesting of the Government of the United States, through some of our foreign Consuls, to obtain all the practicable information in regard to the cultivation and preparation of this valuable article of commerce.

The experiments I have made have been as simple and expeditious as they have been satisfactory in their results. The leaves of the plants have been plucked from the bud, around which they cluster, tied up in convenient bundles, boiled, and pounded, until the green bark and soft vegetable matter is disengaged from the strong fibres, when they are put in water, and washed out with great ease.

But the apparatus I have suggested, and in which I have great confidence, (sufficient to prepare from two to three tons per day,) is a heavy wooden wheel, to traverse a circular platform, firmly constructed and covered with strong plank. The wheel to turn on a shaft, carved in the form of a screw. One end of the shaft confined and turning on a pivot in the center of the platform, which will cause the wheel in its revolutions to traverse every part of the platform. The action of the boiling water for twenty-five

minutes will prepare the leaves for the wheel. The bundles, which will then have shrunk considerably, should be re-tied, to prevent the tangling of the Hemp, placed carefully on the platform, until it is covered, and the wheel put in motion by the animals hitched to the outer end of the shaft, and moving in a circle on the outer edge of the platform. When the wheel shall have reached one side of the platform, by its revolution on the screw, the animals moving it are to be turned and driven in the opposite direction around the circle, which will cause the wheel to traverse back again to the opposite side. While the wheel is in motion, water should be frequently thrown on the plants, which being permitted to escape by vents from the platform, carries with it all the surplus matter, (in a state of solution,) disengaged from the strong fibres by the friction and pressure of the wheel, until the Hemp is washed perfectly clean. It should then be taken from the platform and hung out to dry, which completes the process of preparation, and the article is ready to be packed up for market.—This process will succeed until a better is devised.

Every good plant will produce one pound of clean Hemp. Some have exceeded that quantity. The best specimens from the uncultivated plant are from three to four feet long, and the fibres coarse or finer, in proportion to the age of the leaf, as you will perceive by comparing the smaller parcel I send you, (composed of the bud leaves only,) with the larger. From five to six thousand plants may be produced from one acre, which will yield as many pounds of good Hemp. The specimens I have shown are estimated, by our most intelligent merchants, as superior to the Manilla, and are considered worth from eight to ten cents per pound in the New-York market. At these prices, there is no cultivation in the United States so valuable.

I have made experiments on the plant known by the name of the "Spanish Bayonet," which abounds on our Southern sea-board, and find the fibre equally good in every other respect, though not so large as that of the "Bear Grass." I learn from men who have been accustomed to cut up the latter plant annually in the cultivation of their fields, that it is almost indestructible. Should this be the case, it would require to be planted but once, after which it will continue through a succession of years to yield its valuable tribute without cultivation. Such results, though very imperfectly realized, will render the Florida Hemp a most important production. It will add to the prosperity of the wealthy, give profitable employment to the laboring classes, both in Agriculture and manufactories, but to the poor it will be an inestimable blessing. It will invite emigration, ensure a dense white population, and make the South the richest and most powerful portion of the country.—Cotton and Sugar can never be produced in great abundance except by slave labor, and the employment of a capital far beyond the reach of the poor. Their culture has therefore a tendency to increase the number of slave, and exclude a white population. But should the Hemp become a valuable staple, as I confidently anticipate it will from the simplicity and care of its culture, and abundant production, it will give the richest and most generous reward to the laborer. There are none so poor as to be unable to avail themselves of its advantages to some extent. The bounty of Providence has placed it within their reach. The production of a few acres will yield a sufficient support for a small family at greatly reduced prices; and where they may not be able to procure the necessary apparatus for boiling the Hemp, the same result may be produced by steeping it in cold water for the space of twenty days, after which they can prepare more of it for market with their fingers alone in one day, than they can pick of cotton in two. Let the culture be once introduced, and it will never be abandoned while good Hemp is worth two cents per pound. I have the honor to be

Very respectfully, your ob't servant,
R. K. CALL.

ALPACCA SHEEP.—We have been waiting for an opportunity to *re*-call public attention to this animal—we say *re*-call, because we believe (not having the volumes exactly at hand) that about *twenty years have elapsed*, since we caused the several varieties of Peruvian Sheep, and among them the Alpacca, to be engraved for the "AMERICAN FARMER," and by aid of Mr. Robinson, author of the History of Mexico, pointed out their peculiar adaptation to our *Southern mountain lands*, and, in the most emphatic manner dwelt upon the advantages that ought to be expected from their importation.

It was the year after *guano* was distributed, and the whole story told of the qualities and advantages of *both*; but nothing but English experience and English recommendation, it seems, will go down with our people. When we come to re-publish what was then said of these animals, we shall see how much or how little of any thing *new* has been discovered, since Robinson described them, to prompt the disposition which we now rejoice to see prevails in various quarters, to send out and import them.

But we here throw out, not any settled conviction, but a strong impression, that they will not be found to answer in cold regions. We shall endeavor to find room in a subsequent number for what may be useful and necessary for the curious or interested inquirer.

Since writing the above, we have seen it stated by Professor Johnson in one of his lectures, that a friend of his had found that they will not thrive and do well in Scotland.

The following may be instanced as among the promising signs of the times:

Extract from a letter to the Editor of the Farmers' Library, dated .WINCHESTER, Kentucky.

"We are about forming a company to send to Peru for the Alpacca, and wish to gain all the information we can on the subject."

HUNT'S ECONOMICAL BREAKFAST POWDER. Rye roasted along with a little fat. *Use.* As a substitute for foreign coffee, of which it is one of the cheapest and best.

[Cooley's Cyclopædia of Prac. Receipts.

INSECTS INJURIOUS TO VEGETATION.

REPORT ON THE

INSECTS OF MASSACHUSETTS INJURIOUS TO VEGETATION, BY THADDEUS WM. HARRIS.

On undertaking to conduct a periodical designed to be useful, not only by illustrating practical Agriculture and detailing the result of actual experiments in the field, but by exhorting young farmers to extend the range of their reading and to cultivate a fondness for the study of sciences and literature that bear relation to practical Agriculture, we considered it to be one of our first duties to recommend, in the strongest terms we could employ, the *study of Entomology*, or the character and habits of *Insects*. For motives to prompt the young farmer to this field of investigation, we need go no farther than to the very first sentence in the book before us—a work which we earnestly commend on its own merits, and for the benefit of the agriculturist, and not to serve any interest of either author or publisher.

"The benefits which we derive from insects," says Doctor Harris, "though neither few in number nor inconsiderable in amount, are, if we except those of the silk-worm, the bee and the cochineal, not very obvious, and are wholly beyond our influence. On the contrary, the injuries that we suffer from them are becoming yearly more apparent, and are more or less within our control. Before suitable remedies can be discovered and effectually applied, it is necessary that our insect enemies should be recognized, and their habits generally known."

This account of the insects injurious to vegetation in Massachusetts, which appears to have been prepared under instructions from Governor Everett, is doubtless applicable in a great degree to the whole Union. The very suggestion of such a work showed enlarged and liberal views on the part of a Chief Magistrate of a State, and is enough, in connection with the general knowledge of *his* various and elegant attainments, to warrant the supposition or inquiry whether these instructions themselves would not have formed an interesting preface or appendage to a performance which in our humble opinion seems to have been executed with the judgment and zeal of a disinterested naturalist and accomplished scholar.

As to the general plan of the work, the author observes—

"While I have not thought it expedient to avoid the use of a scientific classification, and have even been at some pains to point out the characters on which this classification is founded, and the peculiarities of the various groups of insects under consideration, it has been my endeavor to treat the subject in a plain and familiar way. No more of the technical language of Entomology has been introduced, than was absolutely necessary to define and discriminate the different insects, whose transformations are described, and in most cases the scientific names and terms have been explained whenever they occurred."

The following passages are all for which we can find room; but these are full of instruction for those who have not turned their attention to this interesting branch of Natural History, and will of themselves awaken the young reader to some sense of the vast field which displays itself for his amusement and instruction—one for which he has no distance to travel, for it is open to him on every side, with objects innumerable to occupy in the most agreeable manner many moments of leisure for which the uninstructed can find no employment, and hence are liable every day to be overcome with listless ennui.

> "The primrose by the river's brim
> A simple primrose is to him,
> And it is nothing more."

As this Report is designed for the use of persons who may not have elementary and other works on this branch of Natural History at their command, it may be proper to begin with some brief remarks on insects in general, in order to show how they are formed, and wherein they differ essentially from other animals.

The word *Insect*,* which, in the Latin language, whence it was derived, means cut into or notched, was designed to express one of the chief characters of this group of animals, whose body is marked by several cross-lines or incisions. The parts between these cross-lines are called segments or rings, and consist of a number of jointed pieces, more or less movable on each other.

Insects have a very small brain, and, instead of a spinal marrow, a kind of knotted cord, extending from the brain to the hinder extremity; and numerous small, whitish threads, which are the nerves, spread from the brain and knots, in various directions. Two long air-pipes, within their bodies, together with an immense number of smaller pipes, supply the want of lungs, and carry the air to every part. Insects do not breathe through their mouths, but through little holes, called spiracles, generally nine in num-

* *Insectum* is an abbreviation of *intersectum*; and from the same source we have the word intersect, to cut or divide.

ber, along each side of the body. Some, however, have the breathing-holes placed in the hinder extremity, and a few young water-insects breathe by means of gills. The heart is a long tube, lying under the skin of the back, having little holes on each side for the admission of the juices of the body, which are prevented from escaping again by valves or clappers, formed to close the holes within. Moreover, this tubular heart is divided into several chambers, by transverse partitions, in each of which there is a hole shut by a valve, which allows the blood to flow only from the hinder to the fore part of the heart, and prevents it from passing in the contrary direction. The blood, which is a colorless or yellowish fluid, does not circulate in proper arteries and veins; but is driven from the fore part of the heart into the head, and thence escapes into the body, where it is mingled with the nutritive juices that filter through the sides of the intestines, and the mingled fluid penetrates the crevices among the flesh and other internal parts, flowing along the sides of the air-pipes, whereby it receives from the air that influence which renders it fitted to nourish the frame, and maintain life.

All insects are produced from eggs, and none are spontaneously generated from putrid animal or vegetable matter. A few insects, such as some plant-lice, do not lay their eggs, but retain them within their bodies till the young are ready to escape. Other insects invariably lay their eggs where their young, as soon as they are hatched, will find a plentiful supply of food immediately within their reach.

Most insects, in the course of their lives, are subject to very great changes of form, attended by equally remarkable changes in their habits and propensities. These changes, transformations, or *metamorphoses*, as they are called, might cause the same insect, at different ages, to be mistaken for as many different animals. For example, a caterpillar, after feeding upon leaves till it is fully grown, retires into some place of concealment, casts off its caterpillar skin, and presents itself in an entirely different form, one wherein it has neither the power of moving about, nor of taking food; in fact, in this its second or chrysalis state, the insect seems to be a lifeless, oblong, oval or conical body, without a distinct head, or movable limbs; after resting a while, an inward struggle begins, the chrysalis skin bursts open, and from the rent issues a butterfly, or a moth, whose small, flabby wings soon extend and harden, and become fitted to bear away the insect in search of the honeyed juice of flowers and other liquids that suffice for its nourishment.

The little fish-like animals that swim about in vessels of stagnant water, and devour the living atoms that swarm in the same situations, soon come to maturity, cast their skins, and take another form, wherein they remain rolled up like a ball, and either float at the surface of the water, for the purpose of breathing through the two tunnel-shaped tubes on the top of their backs, or, if disturbed, suddenly uncurl their bodies, and whirl over and over from one side of the vessel to the other. In the course of a few days these little water-tumblers are ready for another transformation; the skin splits on the back between the breathing-tubes, the head, body, and limbs of a musketo suddenly burst from the opening, the slender legs rest on the empty skin till the latter fills with water and sinks, when the insect abandons its native element, spreads its tiny wings, and flies away, piping its war-note, and thirsting for the blood which its natural weapons enable it to draw from its unlucky victims.

The full-fed maggot, that has rioted in filth till its tender skin seems ready to burst with repletion, when the appointed time arrives, leaves the offensive matters it was ordained to assist in removing, and gets into some convenient hole or crevice: then its body contracts or shortens, and becomes egg-shaped, while the skin hardens, and turns brown and dry, so that, under this form, the creature appears more like a seed than a living animal; after some time passed in this inactive and equivocal form, during which wonderful changes have taken place within the seed-like shell, one end of the shell is forced off, and from the inside comes forth a buzzing fly, that drops its former filthy habits with its cast-off dress, and now with a more refined taste, seeks only to lap the solid viands of our tables, or sip the liquid contents of our cups.

Caterpillars, grubs, and maggots undergo a complete transformation in coming to maturity; but there are other insects, such as crickets, grasshoppers, bugs, and plant-lice, which, though differing a good deal in the young and adult states, are not subject to so great a change, their transformations being only partial. For instance, the young grasshopper comes from the egg a wingless insect, and consequently unable to move from place to place, in any other way than by the use of its legs; as it grows larger it is soon obliged to cast off its skin, and, after one or two moultings, its body not only increases in size, but becomes proportionally longer than before, while little stump-like wings begin to make their appearance on the top of the back. After this, the grasshopper continues to eat voraciously, grows larger and larger, and hops about without any aid from its short and motionless wings, repeatedly casts off its outgrown skin, appearing each time with still longer wings, and more perfectly formed limbs, till at length it ceases to grow, and, shedding its skin for the last time, it comes forth a perfectly formed and matured grasshopper, with the power of spreading its ample wings, and of using them in flight.

Hence there are three periods in the life of an insect, more or less distinctly marked by corresponding changes in the form, powers and habits. In the first, or period of infancy, an insect is technically called a *larva*, a word signifying a mask, because therein its future form is more or less masked or concealed. This name is not only applied to grubs, caterpillars, and maggots, and to other insects that undergo a complete transformation, but also to young and wingless grasshoppers, and bugs, and indeed to all young insects before the wings begin to appear. In this first period, which is generally much the longest, insects are always wingless, pass most of their time in eating, grow rapidly, and usually cast off their skins repeatedly. The second period, wherein those insects that undergo a partial transformation, retain their activity and their appetites for food, continue to grow, and acquire the rudiments of wings, while others at this age, entirely lose their larva form, take no food, and remain at rest in a death-like sleep—is called the *pupa* state, from a slight resemblance that some of the latter present to an infant trussed in bandages, as was the fashion among the Romans. The pupæ from caterpillars, however, are more commonly called chrysalids, because some of them,

as the name implies, are gilt or adorned with golden spots; and grubs, after their first transformation, are often named nymphs, for what reason does not appear. At the end of the second period insects again shed their skins, and come forth fully grown, and (with few exceptions) provided with wings. They thus enter upon their last or adult state, wherein they no longer increase in size, and during which they provide for a continuation of their kind. This period usually lasts only a short time, for most insects die immediately after their eggs are laid. Bees, wasps, and ants, however, which live in society, and labor together for the common good of their communities, continue much longer in the adult state.

In winged or adult insects, two of the transverse incisions, with which they are marked, are deeper than the rest, so that the body seems to consist of three principal portions, the first whereof is the head, the second or middle portion of the thorax, or chest, and the third or hindmost the abdomen, or hind-body. In some wingless insects these three portions are also to be seen; but in most young insects, or larvæ, the body consists of the head, and a series of twelve rings of segments, the thorax not being distinctly separated from the hinder part of the body, as may be perceived in caterpillars, grubs, and maggots.

The eyes of adult insects, though apparently two in number, are compound, each consisting of a great number of single eyes closely united together, and incapable of being rolled in their sockets. Such also are the eyes of the larvæ, and of the active pupæ of those insects that undergo an imperfect transformation. Moreover, many winged insects have one, two, or three little single eyes, placed near each other on the crown of the head, and called *ocelli*, or eyelets. The eyes of grubs, caterpillars, and of other completely transforming larvæ, are not compounded, but consist of five or six eyelets clustered together, without touching, on each side of the head; some, however, such as maggots, are totally blind. Near to the eyes are two jointed members, named *antennæ*, corresponding, for the most part, in situation, with the ears of other animals, and supposed to be connected with the sense of hearing, of touch, or of both united. The antennæ are very short in larvæ, and of various sizes and forms in other insects.

The mouth of some insects is made for biting, that of others for taking food only by suction. In biting insects the parts of the mouth, which are variously modified to suit the nature of the food, are these: an upper and an under lip, two nippers or jaws on each side, moving sidewise, and not up and down, and four or six little jointed members, called *palpi* or feelers, whereof two belong to the lower lip, and one or two to each of the lower jaws. The mouth of sucking insects consists essentially of these same parts, but so different in their shape and in the purposes for which they are designed, that the resemblance between them and those of biting insects is not easily recognized. Thus the jaws of caterpillars are transformed to a spiral sucking-tube in butterflies and moths, and those of maggots to a hard proboscis, fitted for piercing, as in the musketo and horse fly, or to one of softer consistence, and ending with fleshy lips for lapping, as in common flies; while in bugs, plant-lice, and some other insects resembling them, the parts of the mouth undergo no essential change from infancy to the adult state, but are formed into a long, hard, and jointed beak, bent under the breast when not in use, and designed only for making punctures and drawing in liquid nourishment.

The parts belonging to the thorax are the wings and the legs. The former are two or four in number, and vary greatly in form and consistence, in the situation of the wing-bones or veins, as they are generally called, and in their position or the manner in which they are closed or folded when at rest. The under-side of the thorax is the breast, and to this are fixed the legs, which are six in number in adult insects, and in the larvæ and pupæ of those that are subject only to a partial transformation. The parts of the legs are the hip-joint, by which the leg is fastened to the body, the thigh, the shank (*tibia*), and the foot, the latter consisting sometimes of one joint only, more often of two three, four or five pieces (*tarsi*), connected end to end, like the joints of the finger, and armed at the extremity with one or two claws. Of the larvæ that undergo a complete transformation, maggots and some others are destitute of legs; many grubs have six, namely a pair beneath the under-side of the first three segments, and sometimes an additional fleshy prop-leg under the hindmost extremity; caterpillars and false caterpillars have, besides the six true legs attached to the first three rings, several fleshy prop-like legs, amounting sometimes to ten or sixteen in number, placed in pairs beneath the other segments.

The abdomen or hindmost, and, as to size, the principal part of the body, contains the organs of digestion, and other internal parts, and to it also belong the piercer and the sting with which many winged or adult insects are provided. The piercer is sometimes only a flexible or a jointed tube, capable of being thrust out of the end of the body, and is used for conducting the eggs into the crevices or holes where they are to be laid. In some other insects it consists of a kind of scabbard, containing a central borer, or instruments like saws, designed for making holes wherein the eggs are to be inserted. The sting, in like manner, consists of a sheath enclosing a sharp instrument for inflicting wounds, connected wherewith in the inside of the body is a bag of venom or poison. The parts belonging to the abdomen of larvæ are various, but are mostly designed to aid them in their motions, or to provide for their respiration.

An English entomologist has stated, that, on an average, there are six distinct insects to one plant. This proportion is probably too great for our country, where vast tracts are covered with forests, and the other original vegetable races still hold possession of the soil. There are above 1200 flowering plants in Massachusetts, and it will be within bounds to estimate the species of insects at 4800, or in the proportion of four to one plant. To facilitate the study of such an immense number, some kind of classification is necessary; it will be useful to adopt one, even in describing the few species now before us. The basis of this classification is founded upon the structure of the mouth, in the adult state, the number and nature of the wings, and the transformations. The first great divisions are called orders, of which the following seven are very generally adopted by naturalists.

It appears to us that every intelligent farmer would find the above-named Report a valuable acquisition to his library. On no subject con-

nected with Agriculture is there so little accurate knowledge diffused among the mass of farmers. An acquaintance with Doctor Harris's book will save them much anxiety and many fruitless efforts, besides serving to beget and to gratify a taste for researches that will impress him with the truth of the remark by another modern and most able foreign writer on the same subject, that, "Whatever many may say of Nature growing old, the naturalist finds her always young and beautiful, always estimable—just as she came from the hand of her Creator, and as she indeed every moment issues afresh from the hand of the Almighty Being. In his hand the youth of Nature is continually renewed; and under his all-ruling Providence, all the millions of apparently distinctive beings only labor in preserving her existence and embellishment." This able Report appears to have been published agreeably to an order of the Legislature of Massachusetts, by the Commissioners of the Zoological and Botanical Survey of the State, and is, we believe, 'out of print.'

FRUIT-TREE BORDERS.

[From the London Gardener's Chronicle, 27th Dec. 1845.]

NOTHING can be of greater importance to a country gentleman than a flourishing and productive garden; and if proper means are allowed, there can be no reason why this should not be the case. True, there are adverse situations and soils, opposed in some degree to the quality of their productions; but gardening is an art, and he who aspires at a masterly knowledge of that art, by dexterity and perseverance renders every opposing object subservient to his skill. A thorough and enthusiastic cultivator of the soil reduces its obstinacy, corrects its barrenness, and causes the bark-bound, stunted trees to assume a living and vigorous appearance. It may be assumed that these are hidden and abstruse matters, which belong exclusively to science, but we deny it; good gardeners know all this, and bad ones should set about learning without delay. Let such begin by casting off their prejudices; let them take their stand by the side of the inquiring and industrious, and their course and success are alike clear.

All Fruit-Trees, of whatever kind, should be planted on shallow ground, more especially if the quality of the soil is adhesive. As a first principle, the border should be dry; and, if not naturally so, drainage, complete and efficient, must be introduced. The drainage must, from its depth, entirely prevent the roots from getting beyond it. The soil between the drainage and the atmosphere should be rendered friable by exposure to the elements, and when it partakes of considerable tenacity I would urgently recommend an admixture of stones, flints, brickbats, or any similar material, say to the extent of one-fourth. These will enable the rains to percolate freely through the body of earth in which the roots are. They will also in dry weather hold moisture, and tend greatly to maintain the border in an equable state. The roots under such circumstances will be satisfactorily placed; no water can remain or be held in the soil sufficiently long to prove injurious: the stones intermixed with the soil will allow it freely to pass into the drainage beneath, where preparation must have been made for its passing readily off.

No kind of fruit-bearing tree should ever be planted deep, the proper position of the roots in planting is to stretch them carefully on the surface of the border, then to cover them loosely with soil to the depth of three inches; on this lay a slight covering of decayed leaves, merely to protect them from drying winds until the roots are perfectly established in the soil. The roots are certain to find their way downward, but when they are down they are not so likely to find their way toward the surface.

Fruit-tree borders should never be dug with the spade. The surface may be stirred and kept open with the fork, and then merely for the purpose of loosening the soil. The roots should be encouraged to the surface by the application of dressings of decomposed leaves. Wood-ashes will occasionally prove useful, and so will soot. These encourage the kind of wood likely to prove productive, and the produce is entirely different, both as regards size and quality, from that where heavy dressings of stable manure are applied, particularly when the borders are imperfectly drained, and the soil of considerable adhesiveness. Manure dug into borders thus circumstanced is only increasing the evil. The soil is constantly wet and spongy. The roots are surrounded with unhealthy fluid; the air never penetrates beyond the surface; consequently, rank and barren wood, in large quantities, is annually, and to no useful purpose, produced. The roots should never be allowed, if it can possibly be avoided, to get beyond the reach of atmospheric influences. It is in such a position alone that they can procure and assimilate the kind of aliment indispensable to the fruitfulness of the trees. When the borders are imperfectly drained, the fruit produced is not only small in quantity, but of inferior quality, and not fit for dessert or kitchen use, compared with such as is grown on dry and healthy soil. Where the situation is bad, it should not by bad gardening be made worse; every means should be adopted to modify an evil, of itself of sufficient magnitude. I should hope that nobody would ever think of planting trees in future without a complete examination of the condition of the soil, and particularly the subsoil, in order, if necessary, to apply those remedies which skillful gardening may suggest; and surely there is sufficient skill and talent among us to meet, if brought into the field, all the exigencies of the case.

ONE WHO HAS HANDLED THE SPADE.

IMPORTING SOCIETIES.

We have already suggested, under deep conviction of its importance, that besides Agricultural Clubs, which should be formed in every neighborhood, there should be Societies established for the attainment of the highest attainable perfection in *particular branches* of Husbandry. We have alluded to the benefit which would result from, and the obligation which rests upon Agricultural Societies and Institutes to bestow a portion of their time and funds in the way of importing such new seeds, grains, fruits, grasses, and implements, as the higher rewards offered by similar societies abroad may have brought into notice and successful operation. In most cases—in fact, in all cases—where the thing imported might be found practicable and adapted to our country, seedsmen and machinists, as the case might happen to be, would, doubtless, take them at cost, and the country would at once enjoy the benefit of their importation and use.

This may be said, too, of animals, as well as of fowls, of machinery, trees, plants, and other things. All that the Society would have to do—and that is the natural and legitimate object of all such Associations—would be to *run the risk of failure;* a risk which the most public spirited individuals are generally unable, and the most opulent unwilling, to encounter, if the thing in view is very costly.

Take, for instance, the following account of a *cart*, so constructed, as it would seem, as to relieve the painful and dangerous pressure of the breechin on the horse, in descending a hill with a heavy load. Unless the principle of it can be so well comprehended as to supersede the necessity of importation, why not send for one, and let the country enjoy the benefit of it? But what is everybody's business is nobody's. For what better object, then, could Societies be formed, than to keep a look-out for, and at once import, whatever a competent committee shall decide to be worthy of importation and trial?—Or, the better to avoid all mistake, where the case is at all doubtful, such Society, by committee, might open a correspondence, and thus, by obtaining descriptions and drawings, assure itself of the worthiness, labor saving properties, or other valuable qualities of the things in view. How much more fruitful of real service to the country would be a few hundred dollars thus expended, than when given in premiums, for the thousandth time, to tempt men to experiments that develop nothing new—expenditures that true economy would forbid.

Let us cite, in way of example, the advantage we derive in this way from the *intellectual* discoveries and dissertations of men of the first abilities in Europe. Societies, with ample funds and judgment highly enlightened, offer gold medals, and other premiums, amounting, in many cases, to several hundred dollars, for best essays on subjects that demand patient experiment and profound investigation by men of the most ample means and of the greatest force of intellect. No sooner are these prize essays made public than they reach our table, and thus become the property of our patrons. Let, then, societies, representing the interests we are advocating, import, for the benefit of their constituents, what cannot otherwise be obtained.—Where drawings are procured, we engage to have them engraved, and widely spread before the public, for public use.

To the Editor of the Mark-Lane Express:

Sir—In reply to the inquiry of "A Farmer," in the Mark Lane Express of Sept. 22, I beg to inform him that I am the maker of an improved one-horse cart, fitted with "Thatcher's patent self-acting break." It is expressly adapted for hilly counties.

By this simple invention, the pressure of a loaded cart, when descending a hill, is made to pass from the breechin and back of the horse to the naves of the wheels. It is found to be effective in relieving the horse from the heavy pressure, and in regulating the speed of the cart in its descent.

	£	s.	d.
Price of one-horse cart, to carry 30 cwt.....	10	10	0
" Harvest shelvings to ditto, extra.....	2	10	0
" Patent self-acting break, extra.....	2	10	0

For farther information, apply to

Yours, &c. WILLIAM CROSSKILL.

Beverley Iron-Works, Hull, Yorkshire.

Remedy for Lockjaw.—Having seen in the Argus of the 21st, an account of the death of the son of Mr. Andrews Wasson, from lockjaw from a nail accidentally run into his foot, I would state for the benefit of those afflicted from similar causes, that a common cent, or a piece of copper bound firmly upon the wounded part, and in actual contact with it, will cause almost immediate and entire relief, and cause the wound to speedily heal, whether it be made by rusty nail, steel instrument, splinter, or any other cause, either in foot, hand or other part of the body.

N. B. Rusty or tarnished copper is preferable to bright copper, though either will answer.

[Correspondent of the Albany Argus.

face of the thighs, encroaching upon the outer surface to the points A A, (Plate 1, Order I,) and then contracting as it extends upward to the points B B, on each side of the vulva, and about four inches* distant from it. They generally have, above the hind teats, two small oval marks, formed by hair growing downward, each of which is about two inches wide by three inches long. These marks are distinguishable also by their color, which is paler than that of the surrounding upward-growing hair.

In the First Order of this Class, the skin of the inner surface of the thighs and adjacent parts, up to the vulva, is of a yellowish color, with here and there a black spot. A sort of bran or dandruf detaches from it.

All Cows whose escutcheon corresponds, in its general shape or outline, with the one here described and seen in the plate, modified as it is in the various Orders, belong to this Class, whatever may be their color or their breed.

SECOND ORDER.—Cows of this Order yield, while at the hight of their flow, *eighteen litres* a day; and they continue to give milk until they are eight months gone with calf.

The marks of this Order are exactly like those of the First Order, (they are designated in the Plate by the same letters,) except that to the right of the vulva and near it there is a streak of hair growing downward (F). This mark is about four-tenths of an inch wide by two and a half inches long; the hair within it is very short. It indicates that the daily yield of the Cow diminishes by about one-sixth, upon her being got with calf.

THIRD ORDER.—Cows of this Order yield, while at the hight of their flow, *sixteen litres* a day, and continue to give milk until they are seven months gone with calf.

Their escutcheon resembles in shape that of the preceding Orders. It differs therefrom in having within it a semi-circle (C) of downward-growing hair, embracing the vulva and extending about one and a half inches below it, while it is about two and a half inches in width. The hair within this semi-circle is more shining and of a lighter color than the ascending hair around. In this Order there is but one oval (E) above the teats, to the left.

FOURTH ORDER.—Cows of this Order yield, while at the hight of their flow, *fourteen litres*, and continue to give milk until six months gone with calf.

The escutcheon differs from those above described in being more contracted—the upward-growing hair occupying less surface. The points A A are not so far apart, and consequently nearer to the inside of the thighs. The points B B are nearer to the vulva—distant from it only about four-tenths of an inch. From these points there is a growth of downward-growing hair, which encloses the vulva, forming with it the two triangles seen in the Plate, one side of which is B C. These triangles also are distinguishable by the hair being more lustrous and of a lighter color.

FIFTH ORDER.—Cows of this Order yield, while at the hight of their flow, *twelve litres* a day, and continue to give milk until they are five months gone with calf.

The escutcheon of this Order, as compared with that of the preceding, is somewhat narrower at the points A A and B B. Below the vulva, there is a streak of descending hair (C) about six inches long by a little over one inch wide. This

* The French measures, which are given in the fractions of the *metre*, have been reduced to English inches. The reduction is not, in every instance, absolutely exact; but it is sufficiently so for practical purposes.

escutcheon is distinguished also by a growth of descending hair (G) on the right thigh, which, beginning at A, encroaches upon the ascending hair, running into the inner surface of the thigh, to the distance of about six inches.

Sixth Order.—Cows of this Order yield, during the hight of their flow, *nine litres* a day, and continue to give milk until four months gone with calf.

The escutcheon of this Order has the same figure as that of the Fifth, only it is more contracted at the points A A. On both thighs there is a growth of descending hair (G G), which runs into the inner surface of the thigh, forming a triangle, the sides of which are about four inches and two inches in length.—Below the vulva is the same mark (C) as in the preceding Order.

Seventh Order.—Cows of this Order yield, while at the hight of their flow, *six litres* a day, and continue to give milk until three months gone with calf.

In this Order, as is seen in the Drawing, the upper part of the escutcheon is entirely wanting on the right side. On the left side it is well defined, though on a very contracted scale, between the points A and B. On the right side, the lower portion of the escutcheon terminates at a point in the line where the two thighs join; that is to say, in a line with the vulva. To the right of this line, the only trace of the wanting half of the escutcheon, above the point just mentioned, consists in a few hairs bristling up against each other.

In this Order the udder is generally covered with a thin growth of coarse hair.

Eighth Order.—Cows of this Order yield, while at the hight of their flow, *four litres* a day, and continue to give milk until two months gone with calf.

The escutcheon is the same as that just described, only yet more contracted and imperfect. Here and there, on each side, a few scattering hairs bristle up within the space occupied by the escutcheon in the more perfect Orders.

What has been said of the distinctive marks of the several Orders of this Class holds good, whatever may be the size of the Cow, except that the *dimensions* above given, having reference to tall Cows, are to be proportionally reduced in regard to those of the other two sizes. Respecting the latter, therefore, it is requisite to state only their yield and the time during which they continue to give milk.

COW OF MEDIUM HIGHT.

First Order.—Cows of the First Order of this Size yield, during the hight of their flow, *sixteen litres* a day; and, like those of the High Size, they continue to give milk until they are eight months gone with calf—the yield gradually diminishing from the time they conceive anew.

Second Order.—These Cows yield *fourteen litres* a day, and continue to give milk until seven months gone with calf.

Third Order.—These Cows yield *twelve litres* a day, and continue to give milk until six months gone with calf.

Fourth Order.—These Cows yield *ten litres* a day, and continue to give milk until five months gone with calf.

Fifth Order.—These Cows yield *eight litres* a day, and continue to give milk until four months gone with calf.

Sixth Order.—These Cows yield *five litres* a day, and continue to give milk until three months gone with calf.

Seventh Order.—These Cows yield *three litres* a day, and continue to give milk until two months gone with calf.

EIGHTH ORDER.—These Cows yield *two litres* a day, and they continue to give milk only until they have conceived anew.

LOW COW.

FIRST ORDER.—Cows of the First Order of this Size yield, while at the hight of their flow, *twelve litres* a day; and they continue to give milk until they are eight months gone with calf—the yield gradually diminishing from the time they conceive anew.

SECOND ORDER.—These Cows yield *ten litres* a day, and continue to give milk until seven months gone with calf.

THIRD ORDER.—These Cows yield *eight litres* a day, and continue to give milk until six months gone with calf.

FOURTH ORDER.—These Cows yield *six litres* a day, and continue to give milk until five months gone with calf.

FIFTH ORDER.—These Cows yield *four litres* a day, and continue to give milk until four months gone with calf.

SIXTH ORDER.—These Cows yield *three litres* a day, and continue to give milk until two months gone with calf.

SEVENTH ORDER.—These Cows yield *two litres* a day, and continue to give milk until one month gone with calf.

EIGHTH ORDER.—These Cows yield *one litre* a day, and continue to give milk only until they have conceived anew.

BASTARD OF THE FLANDERS COW.

Upon entering on the description of these Bastards, I will observe that I shall confine myself to Cows of the High Size; because, to apply the description to those of the smaller sizes, all that will be requisite is to reduce the dimensions of the marks in proportion to the smallness of the Cow.

The Flanders Cow has two varieties of Bastards, (Plate IX, Fig. 1 and 2.)—The first has, within the escutcheon of ascending hair, an oval (J) of downward-growing hair, just below the vulva, and in a line with it, distant therefrom about eight inches. This oval is about four inches long, by about two and a half inches wide; and the hair within it is invariably of a lighter color than that around.—The larger the oval is, the more rapidly will the Cow lose her milk and go dry upon being got with calf. The smaller it is, the less rapid will be the loss of milk; but it will not the less certainly take place, in a notable degree, in every Cow that bears this mark. It will be perceived that the Drawing represents the Cow of the First Order only—this being sufficient to make the reader well enough acquainted with the mark to recognize it when it occurs in Cows of the inferior Orders.

The Bastard No. 2 may be known by the circumstance that the upward-growing hair which forms the escutcheon, instead of lying smooth and pointing straight upward, bristles up like the beards of an ear of wheat, and projects crosswise over the outline of the escutcheon at the points A A. The more extensive the surface of the escutcheon is, and the finer and smoother the hair growing within it, the more abundant is the yield of milk. When this hair is coarse, long and scanty, it indicates a thin, serous milk.

In the Bastards, the skin on the interior of the thighs, up to the vulva, is generally of a reddish color; it is smooth to the touch, and yields no dandruf.

CLASS II.

The Selvage Cow.

The shape of the escutcheon of this Class is very different from that of the First. The upper part of this escutcheon consists, as is seen in the Drawing, (Plate II.) of a growth of ascending hair, rising vertically, and without any interruption from descending hair, to the vulva. Its resemblance to the list or selvage of a piece of cloth is what suggested the name that I have given to this Class.

HIGH COW.

First Order.—Cows of this Order yield, during the hight of their flow, *eighteen litres* a day, and continue to give milk until they are eight months gone with calf. Like those of the First Order of the First Class, they never go dry, if we choose to milk them all the time.

The udder is delicate and covered with a fine, downy hair, growing upward.—The escutcheon consists of a growth of ascending hair, commencing between the fore teats, and also on the inner surface of the thighs just above the hock joint. It expands as it extends upward, till it reaches the points A A. Here it is bounded by a right line, which runs across the inner side of the thigh, from A A to the points D D, which are about four inches distant from each other. From these points right lines rise vertically to the vulva, where they terminate, about an inch and a half apart.

Above the two hind teats, and nearly in a vertical line with them, are two oval marks (E E), formed by a growth of descending hair, distinguishable by its lustre, the size of which is about the same as in the Flanders Cow.

In these Cows, also, the skin of the inner surface of the thighs is of a yellowish color.

Second Order.—These Cows yield, while at the hight of their flow, *sixteen litres* a day, and continue to give milk until seven and a half months gone with calf.

The escutcheon is the same as that of the First Order, only the points A A are not so high up, and the entire figure is on a rather smaller scale. To the left of the vulva, outside of the escutcheon, is a small streak of ascending hair (E), about two and three-fourths inches long by less than half an inch wide. There is but one oval above the hind teats, on the left side. The entire escutcheon is distinguishable by the hair within being more glossy than that around it.

Third Order.—These Cows yield, while at the hight of their flow, *fourteen litres* a day, and they continue to give milk until they are six months gone with calf.

The escutcheon differs from the preceding in the following particulars: it is on a smaller scale; the points A A are nearer to the points D D, and the lines which rise from the latter points meet at the vulva, so as to form an acute angle. On each side of the vulva is a streak of ascending hair (F F,) of the same size as the one in the preceding order; that on the right being, however, sensibly shorter than the one on the left. There is, also, but one of the oval marks (E) above the teats, to the left.

Fourth Order.—These Cows yield, while at the hight of their flow, *twelve litres* a day, and continue to give milk until they are four and a half months gone with calf.

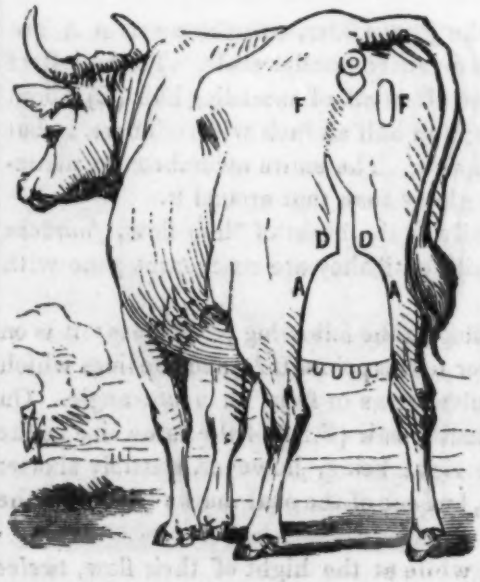
Table II.....Class 2.

THE SELVAGE COW.

Order 1st.

Order 2d.

Order 5th.

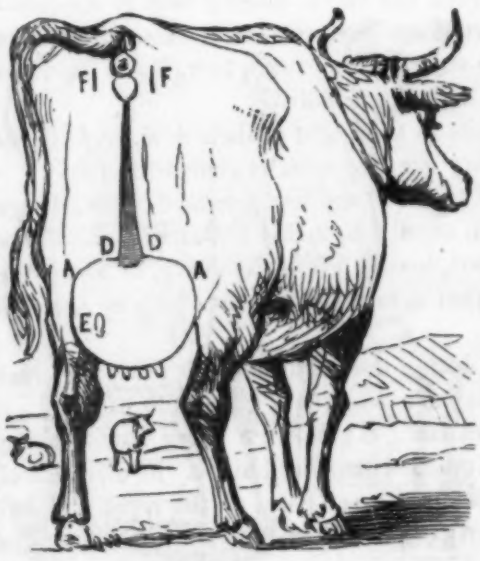


Order 6th.

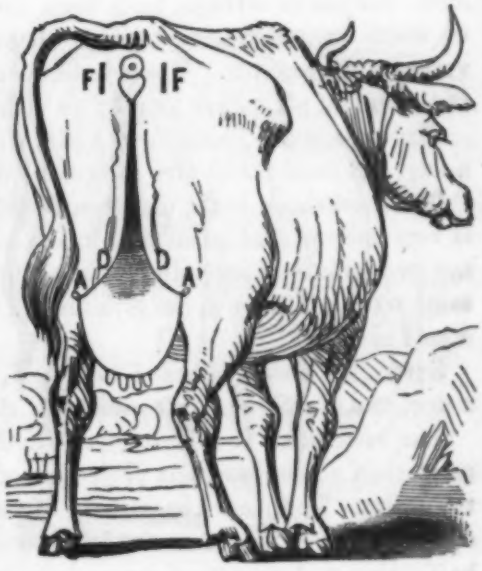
Table II.....Class 2.

THE SELVAGE COW.

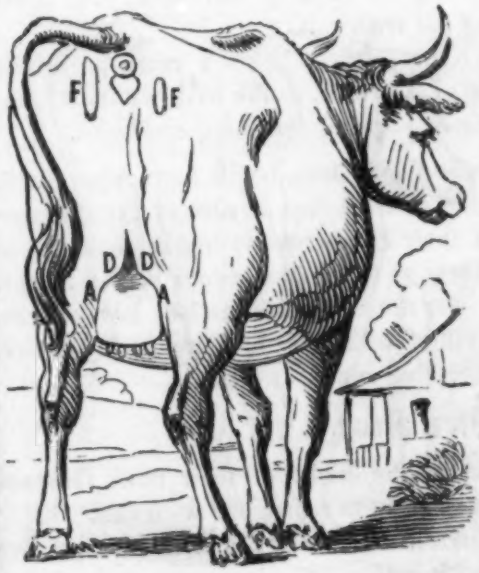
Order 3d.



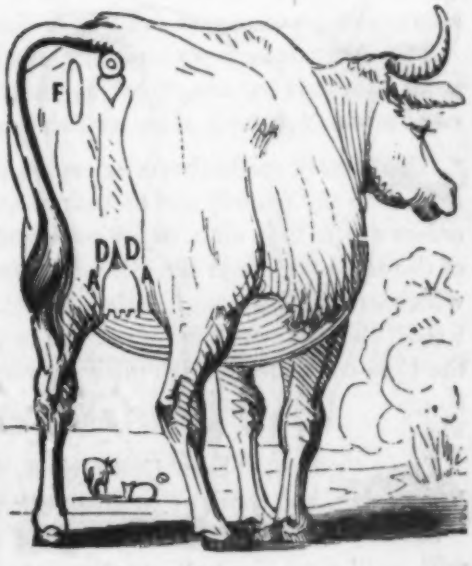
Order 4th.



Order 7th.



Order 8th.



The escutcheon is like that of the preceding order, with the difference that the points A A are considerably lower down than the points D D. The two streaks of ascending hair, on the right and left of the vulva, are longer by nearly an inch, and also wider than in the Third Order; and there is no oval mark above the teats.

Fifth Order.—These Cows yield, during the hight of their flow, *ten litres* a day, and continue to give milk until they are three months gone with calf.

The escutcheon is on a smaller scale than in the Fourth Order; the points D D are much nearer together—the distance between them being less than one inch; the list or selvage, as it rises toward the vulva, takes a turn to the left—its width contracting very much—and runs up, past the lower extremity of the vulva, to the point F. There is but one streak of ascending hair (F) on the right of the vulva, six inches long by an inch and a half wide.

Sixth Order.—These Cows yield, while at the hight of their flow, *eight litres* a day, and continue to give milk until they are two months gone with calf.

The escutcheon is yet more contracted than the one last described; the selvage is very narrow, and terminates in a point, about four inches from its base. There are two streaks of ascending hair, to the right and left of the vulva, of about the same size as the one in the fifth order; that is to say, six inches long by one and a half in width.

Seventh Order.—These Cows yield, during the hight of their flow, *six litres* a day, and continue to give milk until they are one month gone with calf.

The escutcheon is still smaller than the last; the selvage being now nothing more than a small angular projection of upward growing hair, in the direction of the vulva. There are two streaks of ascending hair (F F) on the right and left of the vulva. The one on the left is nearly eight inches long by an inch and a half wide; and consists of coarse hair, which, in growing upward, deflects crosswise toward the outer part of the thigh. The one on the right is of the same width, but only half as long as the other; it consists of hair growing in the same way.

Eighth Order.—These Cows yield, during the hight of their flow, *four litres* a day, and cease to give milk upon being got with calf.

The escutcheon is exceedingly small; the selvage is but a mere projecting point; there is but one streak at the side of the vulva, on the left; which is formed of a scanty growth of coarse hairs, bristling up and deflecting crosswise.

The remark made above, in regard to the First Class, I will here repeat with respect to the present and to the remaining six: all that is said of the different orders of the high size, so far as regards their characteristic marks, holds good of the same Orders in the other sizes, except as to the dimensions of the marks, which are to be proportionally reduced. On the subject of the two lower sizes, I shall therefore confine myself to the yield of milk, and the time during which the Cow continues to give milk after conceiving anew.

COW OF MEDIUM HIGHT.

First Order.—These Cows yield, during the hight of their flow, *fourteen litres* a day, and continue to give milk until eight months gone with calf.

Second Order.—These Cows yield *thirteen litres* a day, and continue to give milk until six and a half months gone with calf.

Third Order.—These Cows yield *eleven litres* a day, and continue to give milk until five months gone with calf.

FOURTH ORDER.—These Cows yield *ten litres* a day, and continue to give milk until four months gone with calf.

FIFTH ORDER.—These Cows yield *eight litres* a day, and continue to give milk until three months gone with calf.

SIXTH ORDER.—These Cows yield *six litres* a day, and continue to give milk until two months gone with calf.

SEVENTH ORDER.—These Cows yield *four litres* a day, and continue to give milk until they have conceived anew.

EIGHTH ORDER.—These Cows yield *three litres* a day, and go dry upon being impregnated anew.

LOW COW.

FIRST ORDER.—These Cows yield, during the hight of their flow, *ten litres* a day; and continue to give milk until they are eight months gone with calf.

SECOND ORDER.—These Cows yield *eight litres* a day, and continue to give milk until they are six and a half months gone with calf.

THIRD ORDER.—These Cows yield *six litres* a day, and continue to give milk until five months gone with calf.

FOURTH ORDER.—These Cows yield *four litres* a day, and continue to give milk until four months gone with calf.

FIFTH ORDER.—These Cows yield *three litres* a day, and continue to give milk until three months gone with calf.

SIXTH ORDER.—These Cows yield *two litres* a day, and continue to give milk until two months gone with calf.

SEVENTH ORDER.—These Cows also yield *two litres* a day, but they go dry upon conceiving anew.

EIGHTH ORDER.—These Cows yield but *one litre* a day, and cease to give milk upon conceiving anew.

BASTARD OF THE SELVAGE COW

The Bastards of this Class, (see Plate IX. Fig. 3) whatever may be their size and the Order to which they belong, are to be known by two patches of ascending hair, (F F) on the right and left of the vulva, distant from it an inch and a quarter to an inch and a half. They are from four to five inches long by about an inch and a half wide. The smaller they are, and the finer the hair within them, the less rapid is the loss of milk which they always indicate. When they consist of coarse hair, and terminate in a point at each end, they indicate that the milk is poor and serous.

CLASS III.

The Curveline Cow.

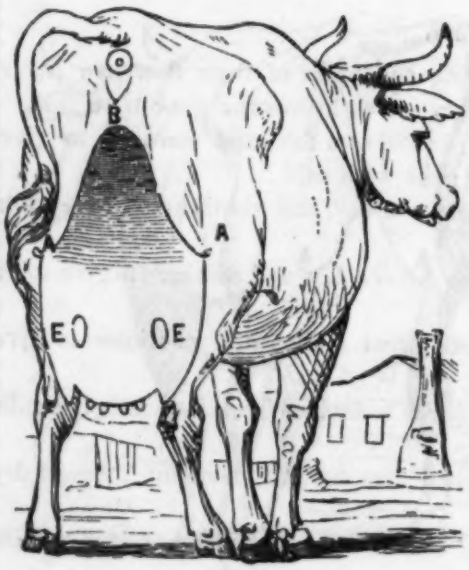
I have given this name to the Cows of my Third Class, because their escutcheon, which is lozenge-shaped, is bounded above by two curved lines; which, commencing to the right and left on the thighs, run up toward the vulva, and meet at a point below it. (See Plate III.)

This Class is a very numerous one; and, in regard to the yield of milk, approximates to the First Class. Cows belonging to it, and to every one of its Orders,

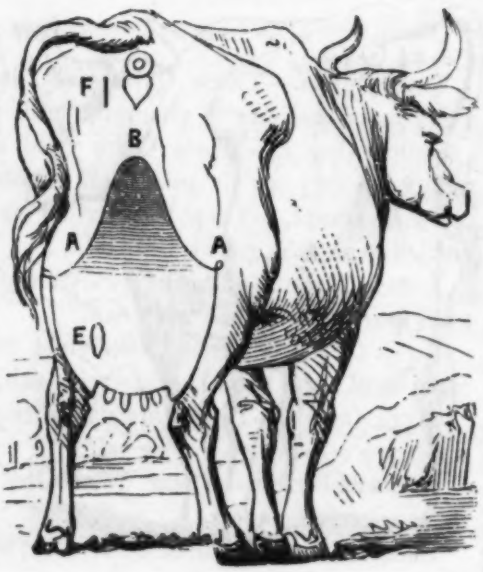
Table III.....Class 3.

THE CURVELINE COW.

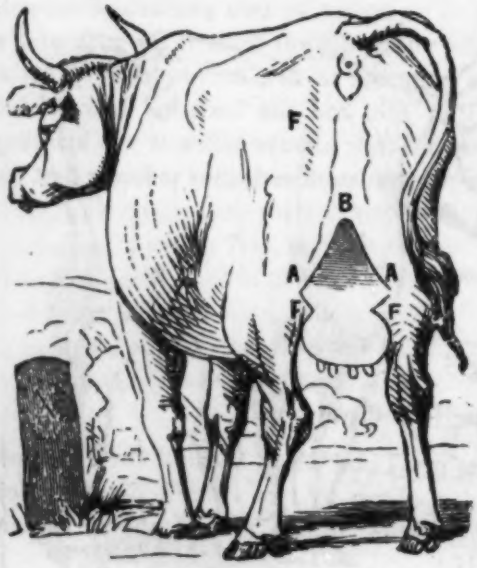
Order 1st.



Order 2d.



Order 5th.

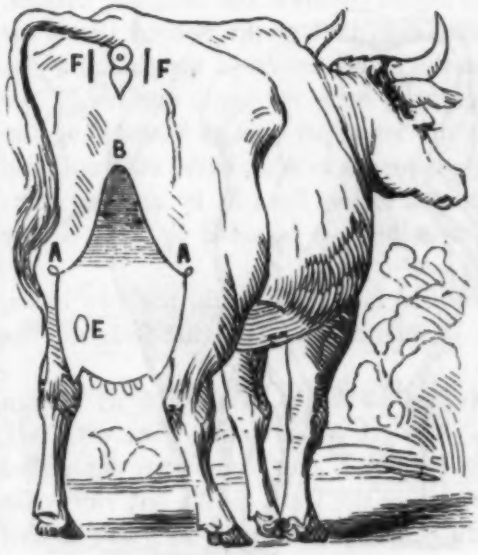


Order 6th.

Table III.....Class 3.

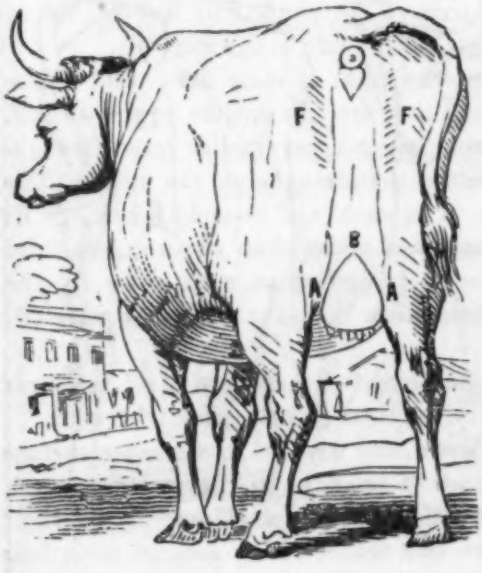
THE CURVELINE COW.

Order 3d.

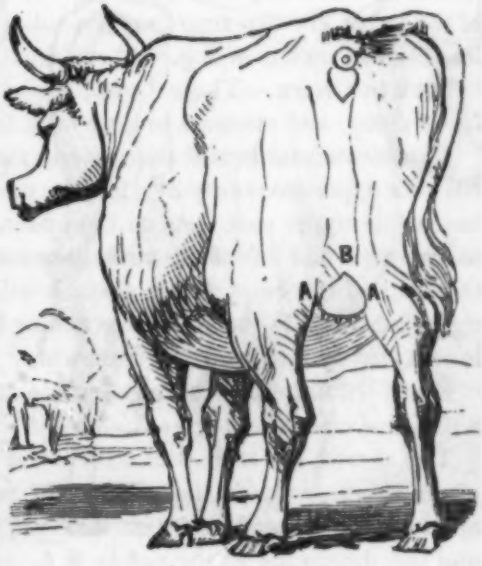


Order 4th.

Order 7th.



Order 8th.



are found in all breeds. The yield varies according to the Order and the size, just as in the First and Second Classes.

HIGH COW.

First Order.—Cows of this Size and Order yield, during the hight of their flow, *eighteen litres* a day, and continue to give milk until they are eight months gone with calf.

They exhibit the same delicacy of texture, and the same yellowish color of the skin within the escutcheon, as those of the higher Orders of the foregoing Classes. The escutcheon, in its upper part, is broader than that of the Second Class. It commences between the four teats, and on the inner surface of the thighs above the hock joint. Rising thence, and encroaching upon the outer surface of the thighs to two points, (A A) about midway up, its upper part is bounded by the lines above mentioned; which, beginning at the points A A, curve outward, and are united, just below the vulva, about an inch or less from it, by another short curved line. (B) The lower part of the escutcheon is bounded by lines on the thighs, curving inward.

Above the hind teats, and nearly in a vertical line with them, are two ovals, (E E) formed by hair growing downward, the same as in the higher Orders of the two preceding Classes.

Second Order.—These Cows yield, during the hight of their flow, *sixteen litres* a day, and continue to give milk until they are seven months gone with calf.

The escutcheon is the same as that just described, only somewhat contracted in all its parts. There is but one oval (E) above the teats, on the left side. On the left of the vulva, is a streak of ascending hair, (F) about an inch and a half long by less than half an inch in width.

Third Order.—These Cows yield, while at the hight of their flow, *fourteen litres* a day, and continue to give milk until six months gone with calf.

The escutcheon is of the same shape as in the preceding Order; contracted, however, in all its parts. The point B is still lower down. To the right and left of the vulva are two streaks of ascending hair, (F F) about four inches long by less than an inch in width. Above the teats, on the left, is one oval (E).

Fourth Order.—These Cows, while at the hight of their flow, yield *twelve litres* a day, and continue to give milk until they are four months gone with calf.

The escutcheon is still the same in shape, but on a yet smaller scale throughout; its upper extremity at a greater distance, therefore, below the vulva. The base of its upper part rests on the udder. The streaks of ascending hair, (F F) on the right and left of the vulva, are longer and wider than those in the third Order; and the hairs within them bristle up, projecting on each side. On the right there is a failure of the ascending hair below the point A, and its place (F) is occupied by hair growing downward.

Fifth Order.—These Cows, while at the hight of their flow, yield *ten litres* a day, and continue to give milk until they are three months gone with calf.

The escutcheon is smaller still, lower down, and confined to the inner surface of the thighs. On the left, there is a patch of bristling hair growing upward, nearly eight inches long by an inch and a half, or more, in width. To the right and left, beginning at the points A A, are two spaces (F F) covered with hair growing downward instead of the ascending hair. They are about four inches in width, and six inches long, running inward toward the crease formed by the meeting of the thighs.

SIXTH ORDER.—These Cows, while at the hight of their flow, yield *seven litres* a day, and continue to give milk until they are two months gone with calf.

The escutcheon is still of the same shape; but the point B is now so far down below the vulva that it must be looked for where the thighs meet. At the point E, under the vulva, is a small patch of ascending hair, about an inch and two-thirds long, by four-fifths of an inch in width.

SEVENTH ORDER.—These Cows, during the hight of their flow, yield *five litres* a day, and continue to give milk until they are impregnated anew.

The escutcheon is yet more reduced in size, and is now hid away between the thighs. To the right and left of the vulva, are two patches of ascending hair, (F F) which bristles up and projects on each side. They are about six inches long by two and a half wide.

EIGHTH ORDER.—These Cows yield, while at the hight of their flow, *three litres* a day, and go dry upon being got with calf.

In this Order, the escutcheon is still perceptible, but it is of a very diminutive size.

COW OF MEDIUM HIGHT.

FIRST ORDER.—These Cows yield, while at the hight of their flow, *fifteen litres* a day, and continue to give milk until they are eight months gone with calf.

SECOND ORDER.—These Cows yield *thirteen litres* a day, and continue to give milk until they are seven months gone with calf.

THIRD ORDER.—These Cows yield *eleven litres* a day, and continue to give milk until six months gone with calf.

FOURTH ORDER.—These Cows yield *nine litres* a day, and continue to give milk until five months gone with calf.

FIFTH ORDER.—These Cows yield *seven litres* a day, and continue to give milk until four months gone with calf.

SIXTH ORDER.—These Cows yield *five and a half litres* a day, and continue to give milk until three months gone with calf.

SEVENTH ORDER.—These Cows yield *three and a half litres* a day, and continue to give milk until two months gone with calf.

EIGHTH ORDER.—These Cows yield *two litres* a day, and go dry upon being got with calf.

LOW COW.

FIRST ORDER.—Cows of this Order and Size yield, while at the hight of their flow, *twelve litres* a day, and continue to give milk until they are eight months gone with calf.

SECOND ORDER.—These Cows yield *ten litres* a day, and continue to give milk until seven months gone with calf.

THIRD ORDER.—These Cows yield *eight litres* a day, and continue to give milk until six months gone with calf.

FOURTH ORDER.—These Cows yield *six litres* a day, and continue to give milk until five months gone with calf.

FIFTH ORDER.—These Cows yield *five litres* a day, and continue to give milk until four months gone with calf.

SIXTH ORDER.—These Cows yield *four litres* a day, and continue to give milk until three months gone with calf.

SEVENTH ORDER.—These Cows yield *three litres* a day, and go dry upon being impregnated anew.

EIGHTH ORDER.—These Cows yield *two litres* a day, and go dry upon being impregnated anew.

BASTARD OF THE CURVELINE COW.

In the Curveline Cow, the growths of ascending hair, (F F) to the right and left of the vulva, require special attention, in regard to their dimensions, to see that they are of the size indicated in the several descriptions of the different Orders. When they are of small size, they do not indicate a very rapid loss of milk; but when they are from four to five inches long, by an inch and a half in width, (in which case they are generally pointed at both ends, and consist of coarse hair,) they may then be considered as the size of a *bastard* Cow, that will go dry so soon as she is got with calf. As a general rule with regard to these marks, the larger they are, the worse will the Cow be in this respect. (See Plate IX. Fig. 4.)

CLASS IV.

The Bicorn Cow.

This name is given to my Fourth Class, because the upper part of its escutcheon represents two horns. Cows of this class are good milkers. They are found in all the breeds which we possess in France. In this, as in the other Classes, the general mark of the Class presents itself under modifications indicative of the Order to which the Cow belongs.

HIGH COW.

FIRST ORDER.—Cows of this Order and Size yield, while at the hight of their flow, *sixteen litres* a day, and continue to give milk until they are eight months gone with calf.

Like those of the same Order in the foregoing Classes, they are distinguished by the delicacy of their udder. The dandruf which detaches from the skin throughout the escutcheon is of a yellowish or copperish color. This escutcheon, as I have said above, has at top two horns, formed in the way that is seen in the drawing. (Plate IV. Order 1.) It begins, as in the foregoing Orders, in the space between the four teats, and on the inner surface of the thighs, just above the hock joint; whence it rises toward the tail, spreading over the inner surface, and partially over the outer surface, of the thighs, to the points A A. From these points, its outline consists of curved lines to the points B B, which are distant about four inches from the vulva. Thence the outline descends again on each side in nearly straight lines, which meet at the point C, immediately beneath the vulva, and at the distance of about eight inches from it. On the right and left of the vulva, are two streaks of ascending hair, (F F) about two inches long by two-fifths of an inch in width.

As in the higher Orders of the Classes already described, so in the present we find, above the two hind teats, two small oval marks, (D D) formed by hair growing downward in the field of ascending hair.

SECOND ORDER.—These Cows, while at the hight of their flow, yield *fourteen litres* a day, and continue to give milk until they are seven months gone with calf.

The escutcheon is the same as in the First Order; except that it is on a smaller scale, and does not reach so high up. The color of the skin within it is the same. Of the two streaks of ascending hair, (F F) on the right and left of the vulva, the one on the left is of the same size as in the First Order, whilst the other is but half as long. Of the two horns, (B B) the one on the right is upward of an inch shorter than the other. There is but one oval mark (D) above the teats, on the left.

Third Order.—These Cows, while at the hight of their flow, yield *twelve litres* a day, and continue to give milk until six months gone with calf.

The escutcheon is of the same shape as in the preceding Order; smaller, and consequently spreading less upon the outer surface of the thighs; the right hand horn shorter, by about two inches, than the one on the left. There is but one of the marks (F) along side of the vulva, on the left.

Fourth Order.—These Cows, while at the hight of their flow, yield *ten litres* a day, and continue to give milk until five months gone with calf.

The escutcheon is smaller than in the Third Order; but the same in shape, except on the right of its lower part, when the following irregularity occurs: below the point A, the ascending hair is encroached upon by a growth of descending hair, that runs into the escutcheon, forming an angle, the point of which is at I I. Measured across from the point A, this angle of descending hair penetrates the escutcheon to the distance of about four inches; whilst the break which it makes in the outline of the escutcheon is from six to seven and a half inches long.

Besides this irregularity in the shape of the escutcheon, this Order is distinguished by a streak of ascending hair (E) under the vulva, nearly three inches long by two-fifths of an inch in width.

Whenever the blemish or irregularity in the escutcheon here described is found, it indicates a more rapid decrease in the daily yield of milk than would be exhibited by a Cow possessing the same escutcheon free from blemish; and the rate of decrease will be proportionate to the size of the blemish; that is to say, to the extent of surface covered by the descending hair where it encroaches upon the field of upward growing hair.

Fifth Order.—These Cows, while at the hight of their flow, yield *eight litres* a day, and continue to give milk until they are four months gone with calf.

The escutcheon the same in shape as the preceding, but on a smaller scale. Near the vulva, to the left, is a streak of bristling hair, growing upward, (F) about six inches long by two wide. At the points A A, on the right and left, are two spaces where the ascending hair fails and is replaced by downward growing hair; which spaces penetrate the inner surface of the thighs to the points I I.

Sixth Order.—These Cows yield, during the hight of their flow, *six litres* a day, and continue to give milk until three months gone with calf.

The escutcheon the same as in the Fifth Order; but smaller, and hid away between the thighs. Above it, to the right and left of the vulva, are two streaks (F F) of ascending hair, bristling up and projecting sideways. They are of the same size as the one in the preceding Order, just described.

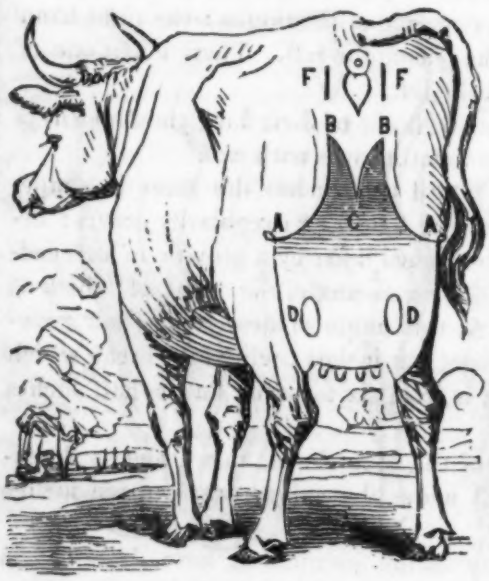
Seventh Order.—These Cows yield, whilst at the hight of their flow, *four litres* a day, and continue to give milk until they are two months gone with calf.

The same escutcheon, but still more hid away between the thighs. The marks on the right and left of the vulva, consisting each of a growth of bristling

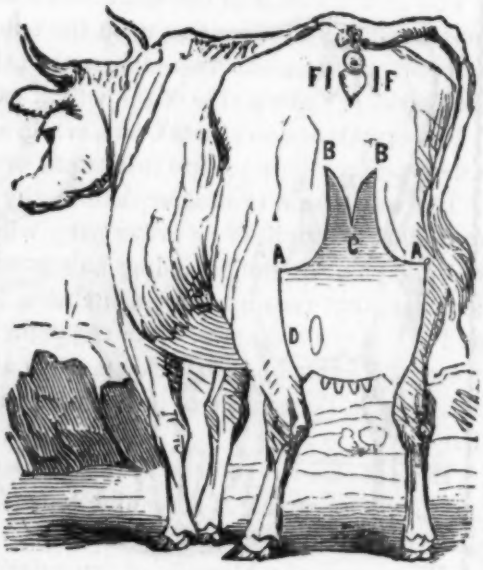
Table IV.....Class 4.

THE BICORN COW.

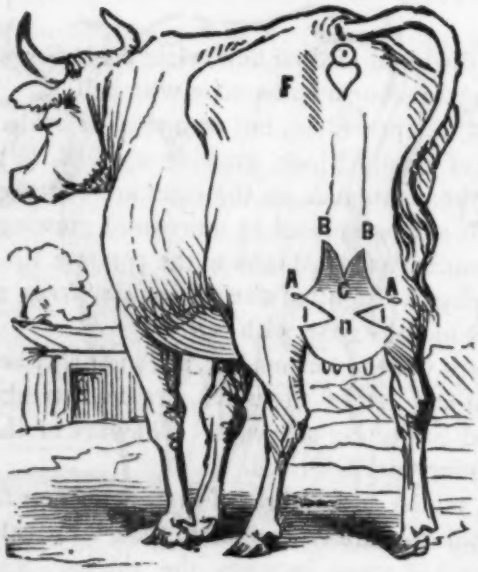
Order 1st.



Order 2d.



Order 5th.



Order 6th.

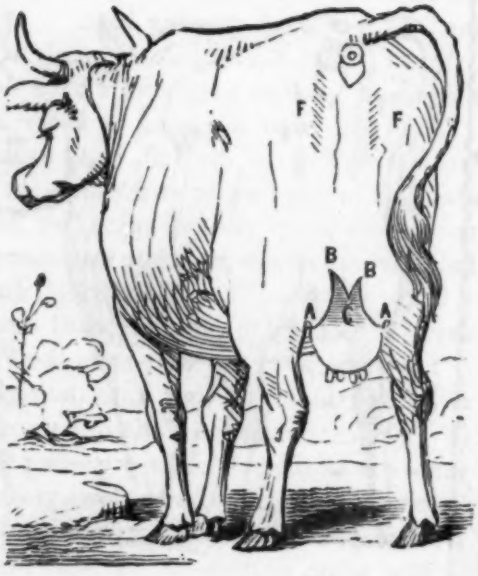
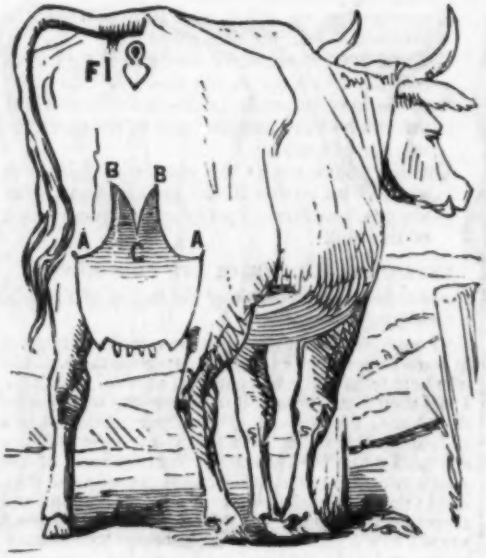


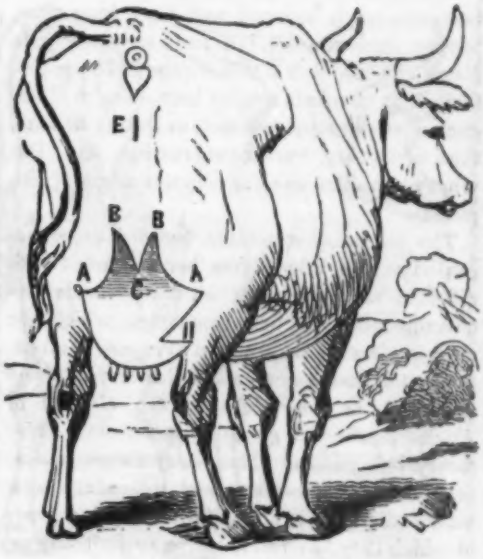
Table IV.....Class 4.

THE BICORN COW.

Order 3d.



Order 4th.



Order 7th.

Order 8th.

QUAKER, OR FRIENDS' FARMING.

[We hope no offence will be taken at the use of the term *Quaker*—it is associated with early and respectful recollections.]

THE question of *thick or thin sowing* of grain has been much agitated and for a long time, (among agriculturists, but more so recently, in England.) Doubtless this dispute has been prolonged, as all others are, by inattention to difference of circumstances—such as quality of land, time of sowing, variety of seasons, &c. But what proposition so clear as not to admit of dispute?

The following statement, founded on actual experiment, as others have been attended with different results, has, for us, the particular recommendation to that confidence which we must confess we are inclined to repose in all experiments and statements of this sort *made by Quakers, or "members of the Society of Friends,"* over all opposing statements—other things being alike! They deny themselves recreation and amusement and self-indulgences, which other people derive from so many sources to which they have no recourse, or positively eschew; that what they do give their minds to they are apt to perform with earnestness, vigilance and exactness. What they eat is clean, what they wear is choice of its kind, and what they do is *well done.* We once knew a Quaker fox-hunter, and he kept the best dogs, and nothing but a good *brook* could stop him. With them nothing is wasted, not even *breath*; they won't speak until the spirit moves, and the best of it is, *they know when to stop.* Pity but we could have a Quaker Congress, but if all were Quakers, a session once in seven years would be quite often enough. Like a mule in mountain-path, they always mind how they step; when you *can* get them to write about Agriculture, what they say *tells.* We wish the spirit would move them to write for the FARMERS' LIBRARY. Hear what an English one says about

EXPERIMENTS ON THICK AND THIN SOWING.—ON THE BEST METHOD OF FEEDING SHEEP.—ON THE POTATO CROP.

To the Editor of the Mark-Lane Express:

SIR: Believing it to be the duty of every man to contribute to the common stock of information whatever his experience may have placed in his power deemed to be of importance, or his position in society has enabled him to collect from the experience of others, I request the insertion in your useful paper, of the following articles on subjects of stirring import at this time, hoping they may be received by your readers in the same spirit and feeling as they have been communicated to, and are now contributed by me, and then, I am sure, great good will result every way.

The subjects which I propose bringing under the notice of your readers are:

Experiments on thick and thin sowing, by broadcast, drilling, and dibbling.

On the best method of feeding the largest number of sheep in the shortest time, and at the least expense, taking into the account the value of the manure, and of the succeeding cereal crops.

On the potato crop; the causes of failure to so large an extent in the present year, with suggestions toward preventing a recurrence of the evil.

EXPERIMENTS ON THICK AND THIN SOWING.

Communicated by a member of the Society of Friends, residing in Essex:

"I remember that last year thou took an interest in some experiments I made to ascertain the produce of wheat from different quantities of seed. I believe I told thee that I intended to pursue the matter a little farther: I have done so; and now enclose thee a statement of the result, thinking thou mayest wish to see it. I was quite convinced, from the issue of last year's trial, that the smaller quantity of seed then used (viz, four pecks per acre) was insufficient, and therefore did not try that quantity again, but limited myself to a comparison of the produce between six, seven, and eight pecks of seed per acre. A perusal of the accompanying statement will show a similar result to that of last year, viz., that the greater quantity of seed produced the largest amount of corn, and that the produce decreased in a larger proportion as the quantity of seed was lessened. Thus:

	qrs.	*bu.*	*pks.*	*qts.*
No. III. Having eight pecks of seed to the acre, produced	2	2	3	5¾
No. IV. Having seven pecks of seed to the acre, produced	2	2	1	5½
Difference	0	0	2	0¼
Equal to 1 bush. per acre.				
No. IV. Having seven pecks of seed to the acre, produced	2	2	1	5½
No. V. Having six pecks of seed to the acre, produced	2	1	2	0¾
Difference	0	0	3	4¾
Equal to 1 bush. 3 pks. 1½ qt. per acre.				

"I consider the autumn of 1844 was a very favorable one for the planting of wheat. I might say unusually so for the description of heavy stiff land which I farm; and, therefore, the trial was made under circumstances propitious to a small quantity of seed; and I, accordingly, sowed less by one peck per acre than I generally do: the working out of the above results is, therefore, such as satisfies me that less than eight pecks should not be sown. I, however, by no means intend to say that a greater quantity may not often be beneficial; I have long entertained the opinion that different soils and different seasons require a difference in the quantity of seed. I think to follow this matter no farther, but will just add that, having just before harvest had an opportunity of looking over the crops of J. J. Mechi, who, perhaps thou art aware, has obtained some notoriety by his agricultural projects at Tiptree Hall, I there saw specimens of thin sowing, viz, four pecks to the acre, side by side with eight pecks to the acre. A large party of agriculturists who were present were unanimous

in estimating the thin sown as far below that which had a more liberal quantity of seed.

"From the accompanying paper thou wilt see that I took the opportunity also of making a comparison between the produce of wheat sown by hand or broadcast, and that sown by the drill; the quantities of land as well as of seed being equal, the result shows in favor of the former as compared with drilling in rows six inches apart, but against it as compared with drilling in rows nine inches apart. The difference of produce between Nos. 2 and 3 has surprised me, having previously held an opinion that the plants could not be too equally distributed over the surface; and, therefore, that smaller intervals between the rows was best. With the view of trying if this was occasioned by any accidental circumstances, I propose to repeat the experiments of Nos. 1, 2, and 3.

"If thou thinkest the statement at all likely to interest any of thy friends, I wish thee to use thy liberty in showing it.

"Account of Produce from equal Quantities of Land (about half an acre) sown with different Quantities of Wheat, or in different Manners.

	qrs.	*bu.*	*pks.*	*qts.*
No. I. Sown broadcast, at the rate of eight pecks per acre.				
Wheat, best	2	1	2	7
do. tail	0	0	2	5
Total	2	2	1	4
No. II. Drilled in rows, six inches apart, at eight pecks per acre.				
Wheat, best	2	1	2	0½
do. tail	0	0	2	4½
Total	2	2	0	5
No. III. Drilled in rows nine inches apart, at eight pecks per acre.				
Wheat, best	2	2	0	7½
do. tail	0	0	2	6½
Total	2	2	3	5¾
No. 4 Drilled in rows nine inches apart, at seven pecks per acre.				
Wheat, best	2	1	3	0½
do. tail	0	0	2	5½
Total	2	2	1	5½
No. V. Drilled in rows nine inches apart, at six pecks per acre.				
Wheat, best	2	0	2	4½
do. tail	0	0	3	4½
Total	2	1	2	0¾

"N. B.—The comparison between Nos. I. and II. is in favor of broadcast sowing over the narrow drilling. Between I. and II. is in favor of wide drilling over the broadcast.

II. and III. is in favor of that drilled at greater distance.

III. IV. and V. is in favor of the greatest quantity of seed.

"That dibbling should be preferable to drilling experience has long shown, could the difficulty be overcome of irregularity in the quantity of grains deposited; whoever shall discover an instrument that will produce that regularity will be a benefactor to his country, and would no doubt be well rewarded by the Royal Agricultural Society, as at least two pecks per acre of seed might be saved with benefit to the crop."

ON THE BEST METHOD OF FEEDING SHEEP.

Communicated by a first-rate farmer resident in Buckinghamshire:

"I last year folded 400 sheep upon turnips, part Swedes, part Norfolks, and part Tancreds, the crop averaging about 20 tons per acre. To each sheep I gave daily half a pint of tick (horse) beans and half a pound of oil-cake (English). The sheep did well. I never lost so few before. The binding quality of the beans seemed to be neutralized by the aperient quality of the cake. The sheep got fat surprisingly fast, and the return greater than I had ever before experienced. I sowed the same land this year with barley, and although a thin, rather hungry soil, my crop averages six quarters (48 bushels) per acre of prime quality. The land is what is considered 18s. per acre land,* incapable of any other improvement than is attainable by manure and judicious cropping. On the same land in former courses, giving the sheep corn only, I sometimes lost from two to four in a score. The manure from the keep was comparatively poor, and the succeeding crop of barley seldom exceeded three quarters and a half to the acre; my sheep being also of less value by several shillings a head than they are this year, after allowing for the difference in prices now and last year. In both cases my expenses were nearly the same."

ON THE POTATO CROP.

Having for several years had the management of a considerable number of field-gardens in this parish, let to the laboring classes, and Potatoes being cultivated in this and the adjoining parishes extensively for sale, my attention has been drawn to the mode of growing and preserving them for use in the winter season, and lately, more especially so, from the unusual degree of injury which the crop has suffered from the cold, wet weather experienced at the early part of the season, and the extreme cold of the last week of July and early part of August; to which circumstances alone I attribute the present defective state of the crop of some kinds of Potatoes, that is, the older kinds, as Goldfinders, Shaws, Champions, and others; whilst the seedling kinds have, comparatively, received but little injury.

It is, I conceive, with Potatoes as with some of the fruits, such as the golden pippin, styer, &c., and the breeding in and in of animals, as well of the two-legged as of the four-legged kinds; that each succeeding generation becomes weaker and weaker, and are more subject to disease than those resulting from good seed and good crosses. The crops, and fruits, and animals have stronger constitutions, and are capable of resisting attacks of disease which poverty of blood from the causes referred to never fails to engender: *hence every encouragement should be given to the raising of Potatoes from seed*, rather than from worn-out tubers; and hence I am of opinion, that the Royal Agricultural [*and all America*] Society would do well to offer premiums for the *best seedling* Potatoes [and fruits, as we have before urged] to be exhibited at their country shows in succeeding years.

The proximate cause of the disease this year was, I conceive, the pulpy state of the tubers and of the haulm, caused by the wet season and the cold, bordering upon, if not actual frost, at the end of July. By checking the free flow of the sap juices to the tubers, the haulm became black, and died away; and the tubers, having been deprived of their necessary food to ensure the requisite degree of perfection, became subject to disease; and in proportion as the constitutional strength prevailed, in a greater or less degree was the degree of destruction that ensued.

Various modes have been suggested for the preservation of what remains: the housing of the tolerably sound ones as dry as possible, and sprinkling them over with plaster of paris (gypsum), in the proportion of half a peck to a sack of Potatoes, placed in layers, is the safest way. The gypsum absorbs the ammonia of the diseased parts, improves the atmosphere around the Potatoes, and hence prevents the possibility of fever among those engaged in sorting and occasionally turning of them, which should not be neglected whilst the weather continues open—

* This means land worth $4 50 rental per acre.

There is this farther advantage, that, if the gypsum so used be strewed over the sets before planting next year, it will stop their weeping, and materially aid in producing a more abundant crop. I know that to be so, from experience; my own crops last year having been so managed were abundant, and of excellent quality.

It is desirable also that larger quantities should not be purchased at any one time by the wealthy than will serve their respective families for a month or so; there would then be a supply for the poor always in the market, at moderate prices. Nor should societies buy up largely to give away: it is always better to risk an increase of price rather than, by buying largely, produce the evil which such large purchases are intended to prevent. The securing of Potatoes to plant in the ensuing year is another point of great importance to be attended to. Seedling Potatoes should, if possible, be procured, and the land that has been planted this year should, on no account, be planted with Potatoes in the next year; but, whatever crops may be planted upon that land, gypsum should form a considerable item in the compost or manure.

JAMES DEAN.

Tottenham, Nov. 8.

[The originals, of which the above are copies, were laid before the Council of the Royal Agricultural Society of England on Wednesday, Nov. 5.]

QUAKERS, *or Friends*—originally called Seekers, from their seeking the Truth; and afterward Friends—a beautiful appellation and characteristic of the relation which man, under the Christian dispensation, ought to bear toward man. Justice Bennet, of Derby, gave the Society the name of Quakers in 1650, because Fox (the founder) admonished him and those present with him to tremble at the name of the Lord. This respectable sect, excelling in morals, prudence and industry, was commenced in England about A. D. 1650, by George Fox, who was soon joined by a number of learned, ingenious and pious men—among others by George Keith, William Penn, and Robert Barclay, of Wry.* The *thee* and *thou* used by the Quakers, originated with their founder, who published a book of instructions for teachers and professors. The first Meeting-house, in London, was in White Hart-Court, Grace Church-st. The first meeting of Quakers in Ireland was in Dublin, 1658, and their first Meeting-house in that city was opened in Eustace-st. 1692. The solemn affirmation of Quakers was enacted to be taken in all cases, in the courts below wherein oaths are required from all other subjects, 8 William III. 1696. This affirmation was altered in 1702 and again in 1721. Quakers were relieved from oaths qualifying persons to municipal offices, 9 George IV. 1828; more expressly relieved by statute 1 Victoria, 1837. This last act was extended to persons who, having been formerly Quakers or Moravians, had seceded therefrom, yet had retained certain opinions as to oaths, 2 Victoria, 1838.

* The Quakers early suffered grievous persecutions in England and America. At Boston, where the first Friends who arrived were females, they, even females, were cruelly scourged, and their ears cut off; yet they were unshaken in their constancy. In 1659 they stated in Parliament that 2000 Friends had suffered persecution and imprisonment in Newgate; and 164 Friends offered themselves at this time by name to Government to be imprisoned in lieu of an equal number in danger (from confinement) of death. 55 out of 120 sentenced were transported to America by an order of Council, 1664. The masters of vessels refusing to carry them, for some months an embargo was laid on West India ships, when a mercenary wretch was at length found for the service.—But the Friends would not walk on board, nor would the sailors hoist them into the vessel, and soldiers from the Tower were employed. In 1665 the vessel sailed, but it was immediately captured by the Dutch, who liberated 28 of the prisoners in Holland, the rest having died of the plague in that year.

SUGAR CULTURE IN TEXAS.

BRAZORIA CO. TEXAS, Nov. 27, 1845.

To the Editor of the N. O. Com. Bulletin:

Dear Sir: The following paragraph in Judge Rost's Oration before the "Agricultural and Mechanics' Association of Louisiana," was published in your valuable journal on the first of this month. You will oblige many of your friends here by re-publishing his remarks on the culture of Sugar in Texas, together with the remarks which I subjoin.

"A person looking upon the map of America," (says Judge Rost) "and perceiving a large portion of Texas south of Louisiana, would naturally suppose that Texas is the better sugar region of the two. But the Louisianian who travels in mid-winter through prairies of that naked land, exposed to the unmitigated fury of north-westers, soon discovers that he has changed climate indeed, but that he has not come to regions in which tropical plants love to grow. I have it from a gentleman of undoubted veracity, Mr. John C. Marsh, that he has planted cane five successive years in the neighborhood of Galveston, and that he has never obtained rattoons from it. You may then consider it as a well-authenticated fact, that in Texas, as far south as New-Orleans, cane will not rattoon; the cold in winter destroys the stubble. I do not mean to say that it may not to some extent be cultivated there; but I assert that the competition will be by no means a dangerous one, and that upon trial it will be found that the Red River parishes of this State are better adapted to that cultivation than the greater part of what has been called the sugar region of Texas.

"Louisiana must remain the great sugar region of the United States; her climate and her soil are the best, and her geographical position is unrivaled. Reflect, sir, that almost every hogshead of Sugar made here is shipped without land carriage; that planters can always obtain from New-Orleans in two or three days any machinery they want, and that their supplies and their market are both brought to their own door. Compare this situation with that of the Texas planter, and you will admit that there is no room for apprehension."

My only object in replying to this article is to correct the erroneous impression which it has or may propagate with persons at a distance who feel an interest in the production of Sugar, and who may be led to believe, that because Mr. Marsh has failed to produce rattoons on the barren lands in "the neighborhood of Galveston," all Texas is involved in the same category.

Eli Mercer, on the Colorado River, in latitude 30, has planted cane successfully for seven years. Last year he produced 63 hhds. of superior Sugar, with but 6 hands, from rattoons *six years old*, and believes it will produce well three to four years longer. His planting is on mulatto-colored cane land.

John Sweeney, on the Bernard River, in latitude 29½, produced last year, with 28 hands, 182 bales of cotton, averaging 500 lbs. and 74 hhds. of superior Sugar, with a rude wooden mill to grind his cane, which is supposed to have ex-

tracted but little more than half the juice. This year's crop is from rattoons five years old. His production of both cotton and Sugar this year will exceed the last. He plants black peach land.

Capt. Duncan, on Caney Creek, and James P. Caldwell, on the Brazos River, have also been eminently successful in planting cane, *and in no instance have the rattoons been lost by the frost.* Last year there was not frost enough to kill the vegetables in our garden, and this fall we have been entirely free of frost till the 20th of this month (November.)

The experience derived by planting cane here seven years, proves that it matures earlier, and the mildness of our fall season gives us longer time to grind than the Louisiana planter usually enjoys. As to our lands, no difference of opinion exists with those who see them; their quality is unrivaled, and large bodies may be had, not subject to overflow, nor *requiring the least expense to drain them*, at from $3 to $8 per acre; 1000 acres in Louisiana, of less real value, would cost probably $50,000, a sum that would buy the Texas planter not only this quantity of land, but also from 70 to 80 hands to work it. An item in interest is thus saved, amounting to $4000 annually. I have no positive data to prove the difference of transporting our sugar to the northern cities, compared with freights from New-Orleans to same ports. There has been but little competition in the commerce of Galveston, yet the freight on uncompressed cotton for three years, has been but ¾ cent per maximum, and ½ cent minimum to New-York; and I deem it fair to say that with the competition that will naturally arise, and the ease with which Galveston can be approached from the Gulf, compared with New-Orleans, with the great saving to vessels in not being compelled to pay high port charges and steaming up the Mississippi River, will keep our freights as low as they will be from New-Orleans. There is another important advantage which the Texas will ever possess over the Louisiana planter: it is in obtaining his beef from his ever fat herds of cattle, and pork, corn and potatoes from his farm, at an inconsiderable expense.

I have deemed it necessary to say this much in reply to the article of Judge Rost, which, from false data, does us great injustice. Nothing can be farther from my intention than to derogate from the many advantages which your gallant State possesses for the culture of Sugar. With the Judge, I fully believe that she has nothing to fear from our competition; for, with reasonable protection, to give us the vastly increasing market of now 20,000,000 of consumers, with a margin for near 200,000 hhds. now filled by foreign importation, we can both march on, hand in hand, identified in our interests, and only rivaling each other in a vain attempt to supply the increasing demand for the richest agricultural product of the earth. COLUMBIA.

FLOODING MEADOWS.

IN answer, for the present, to a correspondent, we believe in Connecticut or Vermont, whose letter we have mislaid, we give the following from the Farmer's Magazine:

PRACTICE OF IRRIGATION.

THE first operation on the intended meadow is, to free it thoroughly of water by draining. If springs exist, they should be cut off by drains of sufficient depth to reach the source of injury. But, in addition to this, the land, if the soil is clayey, or rests upon a tenacious subsoil, should be effectually furrow-drained, so as to afford a ready egress to the water underground. The land is then to be leveled and otherwise prepared. If it is already in old turf, it will be well to pare off the sward with the spade, and after having dug and prepared the ground, to replace the turf. In this manner the meadow will be ready for the reception of the water, as soon as it is formed. But should there be no turf upon the ground, or should this turf be filled with useless or innutritious plants, the land should be thoroughly worked, leveled, and otherwise prepared, and then sown with the suitable grass-seeds. These grass-seeds may be sown in autumn. We cannot, however, in this case, admit the water during the first winter. We must retain the land in pasture for the whole of the following winter and summer, so that the young plants may establish themselves in the soil. But in the second winter we may generally admit the water. The ground may be in part prepared by the plow, and we may even economize expenditure by taking a crop of some kind before we begin to level and otherwise from the meadow; but generally it is better to proceed at once with the formation of the meadow, and employ the spade in place of the plow for leveling and preparing the ground for the reception of the grass-seeds in autumn. Along the higher side of the meadow is first to be formed the main conductor, to which the water is carried, and from which it is conveyed over the surface of the meadow. The earth taken out of this trench is to be employed in banking it, and filling up hollows in the surface of the ground. The size of the main conductor must be proportioned to that of the meadow, and the quantity of water to be conveyed.

The next operation is, forming the main drain, at the lower part of the land to be flooded. It is of the same size as the main conductor, and the earth taken out of it is to be employed in banking or filling up hollows. The surface of the meadow, supposing it to be flat, is now to be formed into beds or planes, from 30 to 40 feet in width, extending from the main conductor to the main drain. These beds may be elevated about 12 inches at the center; they are not curved like the ridges of a plowed field, but form incline planes from the center to each side. At leaving the main conductor they may be 20 inches wide, gradually narrowing to nearly a point at their termination when they reach the surface. If stops of solid earth are left, these may be 6 inches either way, with their diagonal in the line of the feeder, and such of them as are not required may be afterward removed. The earth taken out of these feeders is to be employed in making good their own banks, and in leveling the inequalities of the surface. Corresponding with the feeders, and alternating with them, are

to be formed the series of subordinate drains, communicating with the main drain. They are of the same dimensions as the feeders, with this distinction, that they are widest and deepest where they communicate with the main drain, and become gradually smaller to the upper part of the meadow, where they terminate. The surface of the meadow being formed, the grass-seeds, where no turf has been reserved, are to be sown. The following admixture of grasses will be found suitable:—1. Alopecurus pratensis—meadow foxtail; 2. Phleum pratense—meadow cat's-tail; 3. Agrostis alba—marsh bent grass; 4. Poa trivialis—rough-stalked meadow-grass; 5. Poa pratensis—smooth-stalked meadow-grass; 6. Festuca loliacea—spiked fescue grass; 7. Festuca pratensis—meadow fescue. When the old turf has been replaced, the water, it has been said, may be admitted in the first winter; when grass-seeds have been sown, the water cannot be admitted until the second winter, and sometimes even not until the third. The ground should be depastured with sheep during the first summer to such a degree as to prevent the plants from putting forth their flowering stems and producing seeds.

The next point to be considered is the management of the meadow when completed. At the beginning of October, we are to prepare for admitting the water. To this end the drains and feeders are to be cleaned out, and the banks where injured repaired. The main sluice is then to be withdrawn, when the conductors and feeders will be gradually filled. The next point is to adjust the water in the several feeders. To this end the workman is to observe that each feeder, beginning with the first in order, receives a due quantity of water. If not, he enlarges the mouth so as to allow the proper quantity to enter. He then adjusts the tops in the several feeders, so that the whole surface of the beds shall be covered equally about an inch deep with water. During this and the three following months—namely, November, December, and January—the ground is to be regularly flooded for 15 or 20 days at a time, with intermissions at each time of seven of eight days, during which the ground is to be laid perfectly dry. Farther, when severe frost is threatened, the water is in like manner to be withdrawn, so as that it may not freeze upon the surface. During this, the principal periods of flooding, the meadow is to be inspected every three or four days, to see that no interruption from the breaking of banks, accumulation of weeds, or otherwise, is given to the flowing of the water. When the spring months arrive, and grasses begin to grow, the periods of flooding are to be shortened. In the month of February the water should never be allowed to flow above six or seven days at a time, and in severe frosts it should be withdrawn, so that no ice may be formed upon the meadow. The same management, shortening from five to six days the periods of flooding, may be continued till the middle of March, by which time the meadow will be ready for receiving any kind of stock. In this manner an early supply of herbage is obtained; and after the stock has been removed, as by the beginning of May, the flooding may be resumed and continued till near the end of the month, so as to prepare the meadow for hay. But often this spring feeding is not resorted to. The irrigation is continued during the months of March, April, and until the middle of May, when it finally ceases. But during this period, the frequency and length of time of watering are gradually diminished from five or six days in March, to two or three in the latter period of flooding. Caution is required in flooding as the season advances; because, were the finer grasses to be too long submerged at this period of growth, they would be injured and destroyed. The actual periods of flooding differ with the state of the season and the nature of the soil. A practical rule adopted for irrigation is, never to continue to flood when a white scum is seen to form on the surface of the water, for this indicates that the putrefactive fermentation has commenced in the turf. By the middle of May, or rarely later, the flooding is to cease, and the land to be laid thoroughly dry. The grasses will now grow with great luxuriance, and produce an abundant crop of hay. When the hay is removed, the aftermath is depastured, after which the same process of flooding recommences. Sometimes, after the hay is removed, the ground is again flooded; but in this case, no sheep must be admitted on the flooded land, or, if admitted, they must be such sheep as are to be immediately killed; for this summer flooding never fails to bring with it the disease of rot in its most destructive form. In place of the meadow being applied to the production of hay, it may be applied to the production of green forage for soiling. This is a more profitable mode of applying the watered meadow than for the production of hay. Three crops in this case, may be taken, the meadow being flooded after each crop is removed. [Professor Low on Landed Property.

COST OF SHEEP KEEPING IN ILLINOIS.

BY A. CHURCHILL.

MESSRS. EDITORS: J. S. Skinner requests some of your correspondents to show, "by figures, at how low a price for wool, sheep-growing may be followed as a livelihood." It will be a hard task for any one person to answer the question for the whole State, or even for one county, as the facilities for keeping sheep vary with every individual who keeps them; and without collecting an amount of sheep and feed statistics, at present entirely beyond the reach of any one man, a correct answer cannot be given. But I will attempt to give him the result of my estimate where the summer range on native feed is extensive, and where native hay can be cut in abundance.

I shall estimate for a flock of 1000, allowing a shepherd continually with them during the day, and folds for the night.

Expense of shepherd, including board	$200
Two hundred tons of hay, cut and stacked	200
Interest on fixtures and incidentals	100
Total	$500

Thus it seems that according to my estimate, fifty cents per head would be the least at which they could be kept. The shepherd could not be dispensed with during summer, unless the wolves were destroyed and the pasture fenced and well set with English grass.

There is one flock of 1000, wintering in Du Page county, the cost of which will be about seventy cents per head. The flock arrived late, and the feed must be purchased a little here and a little there, which adds at least fifty per cent. to the cost of wintering.

Wool should not be less than twenty cents per pound to enable the wool-grower to make a "livelihood" of it in Northern Illinois.

To Mr. Crocker's queries I would say that after

ten years' experience in Northern Illinois, I have found that sheep live well on grass or on what they find on the prairies in the fall, even till snow comes, *provided* ALWAYS, *that they are not confined to the same piece of ground.*—Give them a new range every day, or give them English "grass or roots, or both combined."

Prairie may be well set with grass by sowing the seed in the spring, and pasturing close afterwaro It is better to harrow on sowing the seed. Or sow on wet ground, mow in June, and p.sture close through the remainder of the season now the next year in June, and pasture as befo. The third mowing will be principally Engt h grass, especially if timothy and red top are s ved in equal quantities. Or you may, if the sea.on is wet, burn a piece of prairie on which a good coat of old grass remains in June. Sow on plenty of seed, harrow well with a sharp harrow, feed close through the summer, and the next season the tame grass will be found very well set. If the weeds and wild grass are likely to overrun it, mow it in June, and your stock will keep the wild stuff down and allow the tame grass to get a good hold. If for pasture, blue-grass should be mixed with other seed.

If I had a large flock of Sheep and my range was limited, I should in June break a piece of prairie proportioned to my flock. The last of July I would sow turnips and grass seed on the sod, harrow with a light, sharp harrow feed off the turnips in the fall, and expect a good crop of hay the next year. And so I would proceed until I had sufficient land stocked with tame grass. [Prairie Farmer.

Avon, Kane Co. 1845.

☞ Sheep raising on these terms, requiring so much plowing and sowing of seed, and reaping, and turnip culture, could hardly compete, one would think, with sheep husbandry in Georgia, and Mississippi, and Louisiana, and Texas, where, *it is said*, they will live and do well through the whole year, without such expensive preparation and provision of food. By the bye, we consider it a sort of duty to make known that on trial, by a gentleman of experience, who was induced to embark in sheep husbandry, in the neighborhood of Asheville in North Carolina, that country does not, by any means, possess the advantages it was supposed to do for that object. [*Ed. Farm. Lib.*

THE SHEPHERD'S DOG.

WITH SKETCHES AND ANECDOTES.

Extract of a letter from G. W. LAFAYETTE—Chavaniac,* Nov. 5, 1845—to the Editor of the FARMERS' LIBRARY:

"I am here in a place very dear to me—the house in which my father was born. I will remain until December, the time at which I will have to attend the Chamber of Deputies in Paris.

"You must not think I have forgotten the Dogs. To send useful animals so far, it is necessary to choose them with discernment. I hope to be able to send you two dogs from Brie, well broken; the one to remain near the shepherd, the other on the outside of the flock. I will send you, also, two dogs from Auvergne, equal to those of the Alps or Pyrenees. You will receive, at the same time, instructions as to the employment of each."

* CHAVANIAC—the birth-place of General LAFAYETTE, inherited by GEORGE W. LAFAYETTE from his Aunt, MADAME DE LUSIGNAC. The Shepherd's Dog of Brie is about as large as a medium-sized Setter—with long, rough, wiry hair, generally, though not always, black; bright, intelligent, but rather wild-looking eyes; in form loose and gangling, for action and endurance incomparable. With different and suitable training, he is also of great use to the *drover*.

In the mountainous parts of France, the *wolves* are frequently forced by the snows into the valleys and plains, where from their size and voracity, they become exceedingly dangerous to both man and beast—not unfrequently destroying both, in the very midst of the villages. In these regions, the flocks are protected by large mastiffs—dogs of the largest size, of great intelligence, and of magnificent appearance—two of which are considered more than a match for any wolf. The breed exists in its greatest purity in the Pyrenees.

The disposition which exists to establish large sheep farms in the mountainous and other portions of the Southern States, so far south as not to require cultivated food in winter, can never be carried out successfully until some legislative provision is made against sheep-killing dogs, and until there shall exist a more general conviction of the indispensable services of Shepherd's Dogs, and provision be made for a more general supply of them, with the knowledge of the manner of raising and using them. It is with a view to all these objects that we wrote a friend on whom has descended, in all its force, his father's love of America, and it is with the same views that we shall endeavor to familiarize our readers with all the bearings of the subject. For shepherds, we are inclined to believe that, where they can be had, the Indians and Mexicans will make the best. There is in their nature and habits something pastoral, quiet and solitary, that serves to adapt them to the care of flocks. If the Alpacca is ever to be acclimated in this country, it must be in high, dry and warm regions, wherever they are to be found. We may be mistaken, but—*we shall see.*

The danger is, on the first introduction of Shepherd's Dogs, that their use may be abandoned in disappointment and disgust, from want of reflection on the part of the sheep-owner that the *sheep*, as well as the dog, will require to be *trained*. In our country no sight is more terrible to sheep than that of a dog. All their asso-

ciations with him warn them of danger and destruction. It is related of Mr. *Jefferson*, to whom a well-broken Shepherd's Dog had been sent from abroad, that after explaining to his visitors the sagacity and usefulness of the Shepherd's Dog, he led them to the fields, taking along the dog, to give them an exhibition of his fine qualities. On the first indication of what he was to do, the dog made for the sheep, and they scattered in all directions, terrified to death, and the dog not much less confounded at their strange behavior. Some of them threw themselves over precipices, and the dog was never recovered.

Sheep must be brought up in familiar intercourse with the dog, that he may mind and manage them. The fear of dogs, with our sheep, is doubtless hereditary, as are other qualities of animals, of which many and curious instances might be given. In a communication to the Royal Society in 1807, Mr. Knight cited several instances of domesticated animals inheriting the *acquired* habits of their parents. In all animals, he says, this is observable; but in the dog, he says, it exists to a wonderful extent, and the offspring appears to inherit not only the passions and propensities, but even the resentments of the family from which he springs.—"I ascertained that a terrier, whose parents had been in the habit of fighting with polecats, will instantly show every mark of anger when he first perceives the scent of that animal, though the animal itself be wholly concealed from his sight."

In MARTIN'S HISTORY OF THE DOG, he says:

"The Shepherd's Dog is of middle stature, or rather low in proportion to its length, slightly but vigorously formed, and quick and active in its movements. Though not quarrelsome, it is very courageous, and will resolutely encounter the fox in defence of the sheep; and though, unlike the spaniel, it is indifferent to caresses, and distant toward strangers, yet to its master it is most devotedly attached. When the labor of the day is over—when the sheep are folded for the night—it returns with him home to his humble cottage, and there curls up underneath his chair, or sits by his side and partakes of his simple repast. Where flocks are of large extent, and have to be watched during the night, and in cases where several hundred weaning lambs, wild and capricious, demand the care of the shepherd night and day—when winter storms of snow come on, and the scattered sheep have to be hastily collected and brought to a place of security, it is then that the shepherd feels to the full the value of his dog. A circuit of miles on the dreary hills or mountain-side, or over vast and trackless downs, has to be taken, and that without loss of time; to the dog is this duty entrusted, and well does he perform his office; not a sheep belonging to his master's flock is missing—unless, indeed, any have been stolen or killed; the whole are gathered together without intermixture with the sheep of other owners."

* * * * * *

"We have often seen the Drover's Dogs, at their master's bidding, single both sheep and cattle from the drove, and separate them, or drive them to some spot apart from the rest; we have seen them part the droves of two or more drovers traveling in company, which have become mingled together at a halting-place by the road-side, and arrange them in order for continuing the journey; we have seen them turn back the herd from a forbidden lane or gateway, or run before and plant themselves in the way, so as to prevent any of the cattle from going astray. During his long, slow journey from the west or the north of our island to the great capital, the drover finds his dog of all-important utility; nor without this assistant could the crowded cattle in Smithfield Market be at all managed."

The following farther extracts from the same work will be found entertaining, especially the one from Darwin's journal:

The dog is intelligent, but some breeds are far more so than others, and some individuals are elevated above their fellows. Greatly indeed does the cerebral development vary in different races (and consequently the cranial capacity relative to the rest of the skull), as may be seen by comparing the skulls together. The superiority in this respect of the skull of the spaniel over that of the bull-dog is most decided,—and it is in the spaniel, and those breeds most nearly related to it, that we observe the greatest intelligence and tractability. In the Bull-Dog and mastiff, on the contrary, the bold inter-parietal and occipital ridges of the skull demonstrate the force and volume of the muscles of the jaw and neck. It is in these dogs that we find the most indomitable courage and the most combative disposition. M. Elzéar Blaze says, "Le chien est courageux, mais son courage augment beaucoup en la présence de son maitre, soit qu'il veuille le défendre, soit qu'il se sente plus forte d'un tel appui, soit enfin qu'il veuille mériter son estime."* The fact is, that so utterly subjugated is the dog and so dependent on man, that he looks to his master for support and encouragement, and even the most pugnacious dogs fight more resolutely when they are encouraged by their master's voice. In South America, the large sheep-dogs which guard the flocks display courage only when in charge of the sheep. The following extract from Mr. Darwin's journal is very interesting:—"While staying at this estancia (in Banda Oriental) I was amused with what I saw and heard of the Shepherd Dogs of the country. When riding, it is a common thing to meet a large flock of sheep guarded by one or two dogs, at the distance of some miles from any house or man. I often wondered how so firm a friendship had been established. The method of education consists in separating the puppy, when very young, from the bitch, and in accustoming it to its future companions. An ewe is held three or four times a day for the little thing to suck, and a nest of wool is made for it in the sheep-pen.—At no time is it allowed to associate with other dogs, or with the children of the family. The puppy, moreover, is generally castrated; so that when grown up, it can scarcely have any feelings in common with the rest of its kind. From this education it has no wish to leave the flock, and just as another dog will defend its master,

* "The dog is courageous, but his courage increases in the presence of his master; whether it be that he wishes to defend him, or that he feels himself stronger with such assistance, or that he desires to merit his approbation."

man, so will these the sheep. It is amusing to observe, when approaching a flock, how the dog immediately advances barking—and the sheep all close in his rear as if round the oldest ram. These dogs are also easily taught to bring home the flock at a certain time in the evening. Their most troublesome fault when young is their desire of playing with the sheep, for in their play they sometimes gallop their poor subjects most unmercifully. The Shepherd Dog comes to the house every day for some meat, and immediately it is given him he skulks away as if ashamed of himself. On these occasions the House Dogs are very tyrannical, and the least of them will attack and pursue the stranger. The minute, however, the latter has reached the flock, he turns round and begins to bark, and then all the House Dogs take very quickly to their heels. In a similar manner a whole pack of the hungry Wild Dogs will scarcely ever (and I was told by some, never) venture to attack a flock guarded even by one of these faithful shepherds.* The whole account appears to me a curious instance of the pliability of the affections of the dog race; and yet, whether wild, or however educated, with a mutual feeling of respect and fear for those that are fulfilling their instinct of association. For we can understand on no principle the wild dogs being driven away by the single one with its flock, except that they consider, from some confused notion, that the one thus associated gains power, as if in company with its own kind. F. Cuvier has observed that all animals which enter into domestication consider man as a member of their society, and thus they fulfil their instinct of association. In the above case, the Shepherd Dogs rank the sheep as their brethren; and the Wild Dogs, though knowing that the individual sheep are not dogs, but are good to eat, yet partly consent to this view, when seeing them in a flock, with a Shepherd Dog at their head." It appears to us that the Shepherd Dog, in this instance, regards the sheep as his supporters and his care, and feels exactly what a House Dog feels when strangers or strange dogs intrude upon the premises. We have frequently seen a large dog under such circumstances retreat before one of inferior power, which he would not have done otherwise. The Wild Dogs spoken of by Mr. Darwin are dogs left to themselves, and which, like the horses and cattle, have resumed a life of independence; but perhaps they have not learned the power which union gives, and each thinking only of itself individually, fears to attack a champion who stands so boldly on the defensive. The circumstance of the dog regarding itself as one of a flock of sheep, and as the guard of those sheep, and not the friend and servant of one master, is not without a parallel under other circumstances, in which the animal attaches itself not to one, but to a collective number of individuals, which together constitute a master. We say nothing of the Fireman's Dog, of which everybody has heard; there are other examples upon record. "In the first regiment of the Royal Guards," says M. Blaze, "we had a dog called *Bataillon*. Entertained by the soldiers at the guard-house, he always remained there: his masters changed every twenty-four hours; but that gave him no uneasiness. Sure of his pittance, there he stayed. He would follow no one to the barracks; but looked upon himself as the humble servant of twelve soldiers, two corporals, a sergeant, and drummer, whoever they might happen to be; and without being uneasy about the matter. During the night, when it froze hard, the sentinel frequently called *Bataillon*, and took his place to warm himself at the stove: the dog would have suffered death rather than have passed beyond the door. When we changed garrison, the dog followed the regiment, and immediately installed himself in the guard-house of the new barracks. He knew all the soldiers—he caressed them all, but would take no notice of those who did not wear our uniform. To this dog the regiment was a master—an individual whom he loved. His feeling was for blue dresses with amaranth facings—he despised all other colors."

It is owing to the difference among the varieties of the Domestic Dog in some respects—as in docility, strength, size, speed, keenness of scent, ferocity, &c.; and their similarity in others, as attachment to their masters, fidelity, &c. —that there is scarcely any purpose to which the dog has not been put. Like man, he follows different occupations; the Street Dogs are the lazzaroni of their race. In the earliest times, the dog, like his master, was a mighty hunter. The chase of the ferocious or of the swift was his occupation; he brought the wolf, the wild boar, and the lion, to bay; or tired down the deer and antelope. Soon, however, war became a game at which kings played, and *Væ Victis!* for war in a semi-civiltzed state of society is unmitigated by moderation or humanity. Then was the dog called from the chase, or from guarding against savage brutes the peaceful flocks and herds, to assist human brutes in the destruction of each other; the dog became a warrior, and a most formidable one, either in the citadel, the entrenched camp, or the battle-field. Shakspeare's expression put into the mouth of Anthony, "Cry havoc, and let slip the dogs of war!" is by no means metaphorical.—Dogs of war had long been used before, and were so long after the time of the first bald Cæsar.

Watch dogs were not only kept within the citadel of Rome, but in all the fortresses of the Greeks. The citadel of Corinth was guarded externally by an advanced post of fifty dogs placed 'en vedette' on the sea-shore. One night the garrison slept, overcome with wine: the enemy disembarked, but were received by the fifty dogs, who fought with indomitable courage till forty-nine fell. The survivor, named Soter—history has preserved his name—retreated from the field of battle to the citadel, and gave the alarm; the soldiers were roused, and the enemy was repelled. The Senate ordained that Soter should wear a silver collar, with this inscription, "Soter, defender and preserver of Corinth."

* To these dogs Azara alludes in the following passage:—"Among the dogs, the ovegeros, or Sheep Dogs, are particularly deserving of notice, because in this country, where there are no shepherds, they act in the place of the latter, and take charge of the flocks. Early in the morning they drive the flocks from the fold, conduct them to the plain, accompanying them the whole day, and keeping them united;—and when numerous they surround the flock, defending them from birds of prey, from wild dogs, and other beasts, and even from man, and from every kind of injury. At sunset they conduct the sheep back to the fold, when they lay themselves down upon the ground and sleep, and pass the night in their watchful care over them. If any of the lambs lag behind, they carefully take them up in their mouths, and carry them for a time, returning again and again, if need be, until none remain."

BEES—*Effect of Exposing Bee-Hives to Hot Sunshine.*—It has been mentioned that honey-combs melt when the hives are exposed to a hot sun; but as that happens but seldom, it may be worth while to relate how the catastrophe operates on the bees. Last season a friend of mine had a strong colony, in a straw hive, exposed to the sun. In July he was anxious for the bees to work in a glass on the top of the hive; the entrance being small the heat in the hive increased, so that the combs collapsed. The drenched bees turned outside the hive; while the hum of those that could not enter, caused the affair to be observed. Being at a distance I did not see the catastrophe until the next day. Under the hive were dishes collecting the honey dropping from it, in which many of the poor bees were drenched in their treasure; while outside the hive was literally covered with bees escaping from the wreck. After a little maneuvering, I removed the hive, and part of the combs fell on the floor, crushing many of the bees. Having cleared the floor, and also the broken combs from the hive, after the honey had drained a little, the hive was placed in its former station, fenced from the sun by a cloth. The bees soon took possession again, excepting those that happened to fall on the ground, which were in a sad plight, smeared with honey and dust. In order to relieve them I put the whole into a pail of water, then spread them on a cloth to clean themselves in the sun, which they did, excepting those that were disabled. It is unnecessary to say that if the hive had been shaded the calamity would not have happened; but before honey-combs collapse, a hive must be hot indeed. It is surprising what an amount of heat bees can stand inside their hive, even until they are drenched by the vapor from their own perspiration. In hot countries that moisture may be of use to bees; for in summer, with us, they are fond of sipping or licking it; but damp in winter causes their combs to turn mouldy, and often proves destructive to colonies.

[London Gardener's Chronicle.

EGG CEMENT.—White of egg thickened with finely-powdered quick-lime. *Use.* To mend earthenware, glass, china, marble, alabaster, spar ornaments, &c. It does not resist moisture.

PRICES CURRENT.

[*Corrected, February* 18, *for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort.	℔ 100 lb.	3 93½	@ 4 —
Pearls, 1st sort, '45		4 25	@— —
BEESWAX—American Yellow		— 29	@— 29½
CANDLES—Mould, Tallow.	℔ lb.	— 9	@— 11
Sperm, Eastern and City		— 26	@— 38
COTTON—From	℔ lb.	— 6½	@— 9½
COTTON BAGGING—American		— 12	@— 13
CORDAGE—American	℔ lb.	— 11	@— 12
DOMESTIC GOODS—Shirtings,	℔ y.	— 5½	@— 11
Sheetings		— 7	@— 15
FEATHERS—American, live		— 26	@— 31
FLAX—American		— 7	@— 7½
FLOUR & MEAL—Genesee,	℔ bbl.	5 56½	@ 5 62½
Troy		— —	@— —
Michigan		5 50	@ 5 56½
Ohio, flat hoop		5 50	@ 5 56½
Ohio, Heywood & Venice		6 37½	@ 6 50
Ohio, via New-Orleans		5 25	@ 5 37½
Pennsylvania		— —	@— —
Brandywine		— —	@ 5 75
Georgetown		5 37½	@ 5 50
Baltimore City Mills		5 12½	@ 5 25
Richmond City Mills		6 62½	@ 6 75
Richmond Country		5 12½	@ 5 25
Alexandria, Petersburg, &c.		5 12½	@ 5 25
Rye Flour		4 —	@— —
Corn Meal, Jersey and Brand		3 75	@ 4 —
Corn Meal, Brandywine	hhd.	17 50	@— —
GRAIN—Wheat, Western.	℔ bush.	1 15	@ 1 25
Wheat, Southern	new	1 12½	@ 1 20
Rye, Northern		— —	@— 80
Corn, Jersey and North	(meas.)	— 68	@— 70
Corn, Southern	(measure)	— —	@— —
Corn, Southern	(weight)	— 63	@— 65
Oats, Northern		— 47	@— —
Oats, Southern		— 38	@— —
HAY—North River	bales	— 80	@— 90
HEMP—American, dew-rotted	ton	85 —	@100 —
" " water-rotted		125 —	@175 —
HOPS—1st sort, 1845		— 20	@— 25
IRON—American Pig, No 1		35 —	@37 —
" Common		25 —	@30 —
LIME—Thomaston	℔ bbl.	— —	@ 1 05
LUMBER—Boards, N.R.,	℔ M. ft. clr.	35 —	@40 —
Boards, Eastern Pine		11 —	@13 —
Boards, Albany Pine	℔ pce.	— 10	@— 19
Plank, Georgia Pine	℔ M. ft	— —	@35 —
Staves, White Oak, pipe,	℔ M.	50 —	@52 —
Staves, White Oak, hhd		40 —	@42 —
Staves, White Oak, bbl		30 —	@32 —
Staves, Red Oak, hhd		28 —	@30 —
Hoops		25 —	@30 —
Scantling, Pine, Eastern		— —	@16 25
Scantling, Oak		30 —	@35 —
Timber, Oak	℔ cubic foot	— 25	@— 37
Timber, White Pine		— 18	@— 25
Timber, Georgia Yellow Pine		— 30	@— 35
Shingles, 18 in	℔ bunch	1 75	@ 2 —
Shingles, Cedar, 3 feet, 1st quality		— —	@24 —
Shingles, Cedar, 3 feet, 2d quality		22 —	@23 —
Shingles, Cedar, 2 feet, 1st quality		19 —	@— —
Shingles, Cedar, 2 feet, 2d quality		16 —	@18 —
Shingles, Cypress, 2 feet		13 —	@14 —
Shingles, Company		— —	@29 —
MUSTARD—American		— 17	@— 25
NAILS—Wrought, 6d to 20d	℔ lb.	— 10	@— 12½
Cut, 4d to 40d		— 4	@— 4½
PLASTER PARIS—	℔ ton	2 62½	@— —
PROVISIONS—Beef, Mess,	℔ bbl.	8 —	@ 8 50
Beef, Prime,		5 —	@ 5 50
Pork, Mess, Ohio		11 —	@12 50
Pork, Prime, Ohio		9 50	@10 —
Lard, Ohio	℔ lb.	— 7	@— 8
Hams, Pickled		— 7	@— —
Shoulders, Pickled		— 5	@— —
Sides, Pickled		— 6	@— 6½
Beef, Smoked	℔ lb.	— 6½	@— 7
Butter, Orange County		— 15	@— 20
Butter, Western Dairy		— 13	@— 15
Butter, ordinary		— 11	@— 13
Cheese, in casks and boxes		— 7	@— 7½
SEEDS—Clover	℔ lb.	— 8½	@— 9
Timothy	℔ tierce	15 —	@18 —
Flax, Rough		10 —	@— —
SOAP—N. York, Brown	℔ lb.	— 4	@— 6
TALLOW—American, Rendered		— 7½	@— 7¾
TOBACCO—Virginia	@ lb.	— 3	@— 6
North Carolina		— 3	@— 5
Kentucky and Missouri		— 3	@— 7
WOOL—Am. Saxony, Fleece,	℔ lb.	— 38	@— 40
American Full Blood Merino		— 36	@— 38
American ½ and ¾ Merino		— 30	@— 33
American Native and ¼ Merino		— 26	@— 28
Superfine, Pulled		— 28	@— 30